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in cooperation with
Faculty of Management University of Warsaw
Faculty of Law, Economics and Social Sciences Sale - Mohammed V University in Rabat
Polytechnic of Medimurje in Cakovec
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Economic and Social Development

58th International Scientific Conference on Economic and Social Development Development

Book of Proceedings

Editors:
Laszlo Komlosi, Peter Kelle, Damira Djukec

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THE FUNCTIONS OF THE BULGARIAN PROSECUTOR`S OFFICE TO GUARANTEE COMPLIANCE WITH THE LAW DURING INVESTIGATIONS

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ABSTRACT
The actions of the Prosecutor`s Office of the Republic of Bulgaria are positively recognized not only by the Bulgarian society, but also by the previous European Commission in relation to the Cooperation and Verification Mechanism in the field of justice and home affairs. Thus, the last Monitoring Report on the progress of Bulgaria acknowledged the fulfillment of all criteria and the Commission expressed the opinion that the progress made by the Republic of Bulgaria on the Cooperation and Verification Mechanism is sufficient to meet the country`s commitments made at the moment of EU accession. This opinion does not minimize the expectations for outcomes in the fight against corruption and organized crime in the country. Therefore the efforts of the law enforcement authorities in recent years will not remain on an occasional basis, but will impose a lasting trend to strengthen the rule of law in the Republic of Bulgaria.
Keywords: *Functions, Powers, Bulgarian Prosecutor`s Office, Progress, Bulgaria, Positive Outcomes, Good practices*

1. INTRODUCTION

In last few years, significant progress has been made by the Republic of Bulgaria in relation to combating crime and enforcing the rule of law. As a result of the excellent interaction between the judiciary presented by the Prosecutor`s Office of Bulgaria on the one hand and on the other hand the executive presented by the bodies of the Ministry of Interior, State Agency for National Security, Commission for Combating Corruption and Confiscation of Illegally Acquired Property and other institutions, a number of actions have been taken to prosecute persons occupying high state positions for committed corruption crimes. As a result of these activities the sense of justice and equality before the law for all citizens, regardless of their property – or social status, is becoming more and more clearly reaffirmed. This naturally led to high public approval of the actions of law enforcement authorities in last two years. The actions of the Prosecutor`s Office of the Republic of Bulgaria are positively recognized not only by the Bulgarian society, but also by the previous European Commission in relation to the Cooperation and Verification Mechanism in the field of justice and home affairs. Thus, the last Monitoring Report on the progress of Bulgaria acknowledged the fulfillment of all criteria and the Commission expressed the opinion that the progress made by the Republic of Bulgaria on the Cooperation and Verification Mechanism is sufficient to meet the country`s commitments made at the moment of EU accession.

This opinion does not minimize the expectations for outcomes in the fight against corruption and organized crime in the country. Therefore the efforts of the law enforcement authorities in recent years will not remain on an occasional basis, but will impose a lasting trend to strengthen the rule of law in the Republic of Bulgaria. In addition to the above mentioned, there are some specific results having direct impact on public life:

- The Republic of Bulgaria has one of the safest capitals in EU;
- Increased detection of many other criminal acts in connection of which the society is particularly sensitive;
- One of the main highlights in the activity of the Prosecution of the Republic of Bulgaria in the first half of this year was and still is the fight against another long-standing socially dangerous phenomenon that has a direct impact on the lives of Bulgarian citizens, especially in smaller settlements, namely the conventional or so-called “every day” crime (theft, robbery, etc.);
- Last year, unprecedented actions were taken by the Prosecutor's Office against another socially dangerous phenomenon, characteristic to a large extent for the territory of our country, affecting mainly the elderly, namely - the so-called "Telephone fraud". After profound analysis of this type of crime, a new approach was adopted to investigate these crimes. All structural units of organized criminal groups, having concentrated their activities of this type of frauds, are covered. The victims are most often elderly people due to their sensitivity and possibility for psychological effect on the one hand and the mechanism of committing crimes on the other hand (the fraudsters most often point out as reason for the requested funds that the same are needed in connection with a police investigation of telephone frauds or to provide treatment of a victim or of their relative who is severely ill).

Despite the progress made and the results achieved, the Prosecutor`s Office of the Republic of Bulgaria continues to face specific tasks and goals. The fight against conventional crime, in particular crimes against the persons and corruption, continue to be a challenge for us. In this direction we specify several groups of problems, especially when it comes to counteracting corruption practices. At first place they are related to the existing legislation dealing with criminal prosecution. The Criminal Code was adopted in 1968 in the conditions of the socialist system and planned economy. Despite its amendments the Criminal Code does not sufficiently meet the new socio-economic conditions. The excessive formalism of the Criminal Procedure Code should be added to this, which aggravates the criminal proceedings to a significant degree and hinders both the prosecutors and the investigative bodies in the performance of their official duties and the court. From the latter follows the extremely high standard of proof, when the indictment prepared by the respective prosecutor should reproduce the circumstances described in it to the extent that as if the prosecutor witnessed the criminal act, which is unreasonably increased level of detail. Another challenge we face is the correlation between independence and responsibility of magistrates. In order to have such kind of responsibility, there should be well-developed control mechanisms guaranteeing foreseeable disciplinary sanctions. Last but not least, the lack of political will to set a stable legislative basis for an effectively functioning judiciary (2020).

2. FUNCTIONS AND POWERS OF THE PROSECUTOR`S OFFICE

The main functions and powers of the Prosecution are regulated by the Constitution of the Republic of Bulgaria (CRB), Judiciary System Act (JSA), Criminal Procedure Code (CPC), as well as by other laws imposing obligations on the prosecutors in the field of law enforcement (Terziev, Nichev, Bankov, 2016). The participation of prosecutors in civil cases is regulated in the respective civil laws and is also on explicitly provided grounds related to the protection of

an important public interest, for example under the Family Code – claiming matrimony annulment by the prosecutor according to Art. 47, para 1, point 3 and 4 as well as according to para 2, contesting the recognition by the prosecutor according to Art. 66, para 5, participation in adoption proceedings etc. In fact, the involvement of prosecutors in civil and administrative cases requires a lot of human resources in the Prosecutor`s Office, that could be used for the purpose of criminal prosecution. The management of the Prosecutor`s Office of Bulgaria considers that the functions of the Prosecutor`s Office in civil and administrative cases and the compatibility of these functions with the main task of the Prosecution to raise and uphold charges in criminal cases should be reviewed. In this sense is the recommendation of the EU experts magistrates, contained in the Independent Analysis of the Structural and Functional Model of the Prosecutor`s Office of the Republic of Bulgaria and its Independence, dated December 2016, prepared with the assistance of the Office for Support of Structural Reforms of the European Commission (2020).

3. FUNCTIONS OF THE PROSECUTOR GENERAL

The functions of the Prosecutor General, including the functions of overseeing the legality and providing methodological guidance, do not have an impact on any prosecutor in solving specific criminal proceedings. Following the amendments of the Judiciary System Act, dated 2016, the Prosecutor`s Office of the Republic of Bulgaria is no longer a centralized structure. The hierarchical and centralized connection is preserved only between the administrative heads of the prosecutor`s offices themselves and with the Prosecutor General. Power of competence of the Prosecutor General in two separate directions and two separate powers:

- Methodological guidance of the activity of all prosecutors and investigators (Art. 136, para 5 Judicial system Act7, analogically Art. 46, para 5 Criminal Procedure Code) for accurate and uniform application of laws and protection of the legal rights and interests of the citizens, legal entities and the state, by issuing general methodological instructions and guidelines regarding the activity of the Prosecution (power according to Art. 138, para 1, point 6 of Judiciary System Act). These are general acts, they generally refer to the activity of all prosecutors and investigators, they have the characteristic of recommendations, giving organizational preconditions and containing methodological indications for accurate application of law. Through the general methodological guidelines, containing principle directions for similar cases (often in case of legislative amendments) it is precisely the accurate and uniform application of laws by all prosecutors that is achieved. At the same time the methodological guidelines and directions, as being general and of principle, promote professional development and support the independent and autonomous exercise of prosecutorial activity. They do not refer to a specific case. Examples of such methodological acts containing methodological guidelines:
  - concerning the application of certain provisions, separate legal institutes, certain general issues: Guidelines for improving the organization of work of the Prosecutor`s office of the Republic of Bulgaria in applying Art. 53 of Criminal Code and Art. 72 of Criminal Procedure Code on pretrial proceedings (concerning seizure of object/means of crime) for transport crimes; Order of the Prosecutor General on increasing the effectiveness of combating crime by revealing the entire criminal activity and speeding up the investigation of two or more pretrial proceedings against the same accused person; Guideline for institutional and administrative supervision in the Prosecutor`s Office;
  - Concerning the organization and tactics on counteracting specific types of crime: Guidelines on the organization of work of the Prosecutor`s Office of the Republic of Bulgaria on case files and pretrial proceedings, initiated following communication on domestic violence, for death threats and for violation of order for protection from domestic violence; Methodological guidelines for work on files and cases for crimes

against intellectual property; Guidelines on the organization of work and supervision of legality from the Prosecutors Office of Bulgaria during elections and referendums; Guidelines for the organization of the interaction between the bodies of the pre-trial proceedings with general and special competence in case of particularly serious accidents.

The experts who carried out the Independent Analysis of the Structural and Functional Model of the Prosecution recommended that as much of the methodological guidelines and written regulation of the criminal prosecution as possible should be made public, as far as this is compatible with national security and effective criminal prosecution. This recommendation has been partially implemented, and the current leadership of the Prosecutor's Office considers that the positive practice of publishing more acts of this kind should be continued, which will lead to full transparency in cases where the Prosecutor General has exercised his powers of methodological guidance.

- The exercise of legally regulated powers and supervision of legality in specific cases, in accordance with what is explicitly provided in the law (for example Art. 243, para 10 of Criminal Procedure Code, claims for reopening of criminal cases in line with Chapter thirty three of the Criminal Procedure Code etc.) By exercising the explicit power of competence of the Prosecutor General for supervision of legality (Art. 46, para. 5 of the CPC) in specific cases, the legal principle for supervision of legality is put into effect concerning certain hypotheses, falling within the competence of the Prosecutor General, in accordance with the legal requirements. There is a relation between both jurisdictions of the Prosecutor General. This relation is expressed in the fact that with the effective methodological guidance, with the accurate and uniform application of the law by all prosecutors and investigators, the need for the Prosecutor General to rule on specific cases is objectively limited.

There are many legal guaranties that the power of competence of the Prosecutor General is not unlimited and is exercised according to legally regulated procedures. Moreover, the experts who carried out the Independent Analysis of the Structural and Functional Model of the Prosecutor`s Office ascertained this circumstances and made recommendations for more active involvement of the Prosecutor General in specific cases, which is the practice in many prosecution services of EU. Recommendations have also been made that “the administrative heads of prosecutors' offices should refer their staff and be accountable to the Prosecutor General for matters relating to the work of specific sensitive cases carried out under their direction. The information on sensitive cases should be provided upstream so that the Prosecutor General is informed about the work of his staff in cases where he may be asked to explain the actions of the Prosecution. Of course, all opinions on cases expressed by superior prosecutors must be documented in writing in the case file, so that there is an audit trail of the decision - making process. It is again in the independent analysis of the structural and functional model of the Prosecution found that most prosecutors work on the most of their cases with very little or without any interference from above. Attention should also be paid to the recommendation in the Independent Analysis of the Structural and Functional Model of the Prosecution that “the standard for decision-making on internal conviction should be amended, especially what concerns the part of the Prosecution.” For this to happen amendments to the structural Judiciary System Act are needed as well as to the Criminal Procedure Code. We support the view, expressed in the independent analysis, that the lack of opportunity for anyone to intervene in the final decision of a junior or other prosecutor assigned with the case (even when the case is supervised by an appellate prosecutor) is a characteristic of the Bulgarian

system, which causes problems. Furthermore, the experts do not hide their surprise that at present administrative heads have no role in confirming, amending or revoking the prosecutorial decisions of their subordinates, given the fact that prosecutors at regional and district level are subordinate to their administrative heads. We also share the opinion that if the current legal framework is preserved in this form, it is necessary to take appropriate measures to issue an instruction that will give clear methodological guidelines on the application and interpretation of Article 14 of the CPC. The Experts have expressed the view that "it is precisely the change of this standard, together with providing more guidelines by the Prosecutor General that would lead to greater consistency in the decision-making process within the prosecution service and increase the likelihood of achieving a final conviction."

4. CONCLUSION

The cited recommendations show that the legal powers of the Prosecutor General of the Republic of Bulgaria are even more limited than the powers of similar figures in the judicial systems of the other EU states. The Prosecutor General exercises his / her powers only in exceptional cases and according to previously prescribed legal procedures (Terziev, Bankov, Georgiev, 2018-a).

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INTERNET MARKETING COMMUNICATION CHALLENGES - OPINIONS OF CROATIAN CUSTOMERS AND MARKETING AGENCIES

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ABSTRACT

Internet and digital technology have played a major role in the development of digital marketing and marketing branch in general. According to previous research internet marketing become a significant and indispensable part of contemporary business due to the fact that it is often more profitable than the traditional one, and also because it offers better results. But for this to be the case, it is crucial to manage quality communication with consumers. Internet marketing communication is in many ways different from the traditional one, so choosing one itself is a challenge for businesses. The internet helps globalization, so saturation creates a lot of pressure for businesses. It's not easy to survive, much less to be the best and to be competitive, so companies need to respond to new situations in a timely manner. However, the question is whether internet marketing is the right choice for all businesses with respect to their target groups. Therefore, it is extremely important to predict the future, and as the pace of technological development increases with age, it is necessary to assume the characteristics of future generations, as well as the new characteristics of already existing target groups. There are therefore many challenges facing businesses that communicate with their consumers on a daily basis, and this paper aims to investigate and present all the current challenges of internet marketing communication that businesses should consider to survive. On the other hand, it is also important to see how consumers themselves accept these challenges. So, this paper provides insight into the theoretical part, based on secondary data and presents the results of qualitative research conducted on consumers and marketing agencies to gain a better understanding of what is happening on the Croatian market.

Keywords: *challenges, consumers, internet, internet marketing communication, marketing agencies*

1. INTRODUCTION

Because internet marketing is the most dynamic area of marketing, companies need to continuously work on new skills and knowledge. Marketing communication is thus a field that always presents a challenge for companies, especially for those that base their success on relationships with their customers. So, the usage of the internet can rise various challenges in the field of internet marketing communications. This paper was created as a presentation of the results of the conducted research for the purpose of writing a final thesis on graduate study. The paper covers current challenges that arise in internet marketing communication. The first part presents a theoretical overview of the secondary data research and introducing challenges related to internet marketing communication, while the second part of the paper presents results of research conducted with consumers and managers of marketing agencies that exist on the Croatian market.

2. CHALLENGES OF INTERNET MARKETING COMMUNICATION

Internet marketing communication is based on features that differentiate it from the traditional one. These characteristics often, by themselves, present the challenges that companies need to deal with when communicating with consumers via the internet. Based on existing literature (Abashidze; 2017; Broderick and Pickton; 2005; Chaffey et al .; 2009; Dehghani and Tumer; 2015; Hofacker and Belanche; 2016; Leeflang et al; 2014; Okazaki and Taylor; 2013; Quraishi et al. .; 2017, Stokes; 2009) the challenges related to integrated marketing communication, which were later covered by research, are divided into six categories: target groups, consumer activity, internet marketing communication management, changes, security and characteristics of the internet marketing communication. Each category consists of several types of challenges, which actually represent the characteristics of internet marketing communication.

2.1. Target groups

The target group category refers to the challenges posed by the consumer groups that represent the intended recipients of the company's internet marketing communication massages. These challenges are relating to: customer tracking (Leeflang et al., 2014), cultural factors (Okazaki and Taylor, 2013), new audiences (Abashidze, 2017), and generations (Quraishi et al., 2017).
Technology intelligence and the development of the same gives online marketing communication a new dimension that enables companies to deeply monitor their customers. Creating and exploiting rich and effective insights into customer traits, behaviors, wants and needs becomes a necessity for competition (Leeflang et al., 2014). Because the use of technological intelligence requires specific knowledge and involvement of users in the development of the same, not all companies are ready to monitor clients the way the internet allows them to. Consumers' desires and needs are influenced by the environment, so cultural factors also affect their behavior on the internet. This is related to cultural dimensions such as individualism or collectivism, a tendency to seek novelties, communal or agentic tendencies in friendship, and monochrome or polychromatic consumer orientations. Cultural factors make it a particular challenge for companies using international promotion. Significant differences are evident in consumer behavior on social networks, and even when using standardized strategies, marketing communication must be tailored to individual groups (Okazaki and Taylor, 2013), and situational analysis is required for each country (Chaffey et al., 2009). Although cultural factors influence consumer behavior when using social media, social media itself has an impact on consumers, and so new groups of them have evolved. Young consumers and those who use new technologies, regardless of culture, similarly respond to certain marketing communications via social networks and the internet in general. Also, these groups have similar reactions to a certain product category equally advertised in different countries (Okazaki and Taylor, 2013). Abashidze (2017) cites three groups of consumers related to their behavior on the internet: hyper-active consumers, active consumers, passive consumers. In the category of target audience challenges, in addition to these new groups, the challenge of online marketing communication is also posed by certain generations of people. There are still many consumers who are not adept at using the internet, so a corporate focus solely on internet marketing can cause consumer loss (Quraishi et al., 2017), but also the omission of these potential target groups that need to be addressed through traditional media.

2.2. Consumer activity

The category of challenges related to consumer activity consists of several features of internet marketing communication. These characteristics are described below as types of challenges, relating to: managing customer creation and engagement (Leeflang et al., 2014), word of mouth, reviews (Abashidze, 2017), and ad blockers and pop-up blockers (Stokes, 2009). As online consumers take an active role in brand building, another challenge for companies is managing

their online reputation. Governance becomes even more challenging in a marketing environment where social networks play an important role (Leeflang et al., 2014). It also means merely encouraging consumer activation around products, such as encouraging customers to buy via Facebook (Harris and Dennis, 2011). Whether it's advertising, sales, direct marketing, or public relations, and since customer negative reactions can result in a campaign or even brand breakdown, companies should first test their online marketing communications on focus groups and do extensive research (Abashidze, 2017). Managing customer creation and engagement involves a process whose stages need to be elaborated to help the company cope with potential crises or avoid them altogether. Oral messaging with consumers plays a big role in traditional marketing, and on the internet it is taking on a new dimension that further empowers this role. Spreading the message of consumers can reach immense proportions, so monitoring and managing them becomes a big challenge for companies. According to Campbell et al. (2011, Retrieved from Abashidze, 2017), consumers have three basic motives for creating and disseminating such messages: inner pleasure, self-promotion, and change in perception. Reviews are the ratings of customers to whom they share their view of a product, brand, or companies globally, with the aim of alerting other potential customers. This can easily influence others 'opinions, so companies need to be aware of their customers' reviews. They can also be seen as quantitative or qualitative analytical data for comparing companies. Because negative reviews can be shared around the globe around the world, the horn effect (the opposite of the halo effect) occurs, which can affect many people's perceptions, and thus further business development. Negative reviews of one product affect the perception of the other products of that company and thus the overall image (Abashidze, 2017). As the internet became saturated with numerous ads, users were offered the option of installing programs that block those ads, appearing as ad blockers and popup blockers. Internet browsers offer extensions that behave in this way, and internet users who follow technology developments are increasingly using these methods to limit visible promotion (Stokes, 2009). Companies need to discover the extent to which their target groups are using such tools and how to reach potential customers with their use.

2.3. Managing of internet marketing communication

Because internet marketing communication itself is a challenge for companies, once selected, managing it becomes a new challenge. This category thus applies to: choosing the internet over traditional media (Okazaki and Taylor, 2013), adapting to reactive marketing management (Hofacker and Belanche, 2016), relationship building, monitoring (Quraishi et al., 2017), collecting and measuring results. campaign management (pay per click) (Stokes, 2009), budgeting (Broderick and Pickton, 2005), message design, multimedia and integrated internet marketing communication. Whether the company chooses the internet as the sole or main medium of marketing communication depends primarily on the characteristics of the target group, and the task of the companies is to do in-depth research that will discover whether, regardless of all the advantages it carries, it is the internet medium that they need to use. It is necessary to find out if global social media has greater brand building potential than traditional media (Okazaki and Taylor, 2013), and if so, whether the company is prepared to cope with the other challenges of online marketing communication. Internet marketing communication is often initiated by consumers, which speaks to their active position, as opposed to the passivity that characterized them before the development of the internet as a medium. As this has caused a massive dissemination of information, companies need to become reactive and apply this characteristic to managing internet marketing. Internet marketing lacks the presence of a man who makes an important part of selling live products. This prevents companies from building a special type of customer relationship that is of particular importance in recurring sales (Quraishi et al., 2017). Companies need to figure out how to replace the role of online marketers in order

to give them a special touch with their customers. Tracking, collecting and measuring results is extremely important in all marketing activities, and especially in the field of internet marketing. The internet provides numerous tools that make it easy to collect and analyze data. However, companies can easily just fix themselves on numbers instead of using them to optimize campaign growth. The results should always be analyzed statistically, without assumptions, and decisions should be made based on them (Stokes, 2009). Campaign management is generally a challenge for companies, and the internet is usually a pay per click campaign that requires quality management. As the campaign grows, more time is needed to manage it. Pay per click campaigns can provide an exceptional return on investment, but sufficient time must be allocated to such a campaign before entering such a campaign (Stokes, 2009). There are also a number of tools available today to help you manage your pay per click campaign, as well as other types of online campaigns. Nevertheless, this still poses a potential challenge for online marketing communications for companies. Costs on the internet can vary depending on various factors, so they are low for some companies and high for some. In any case, the challenge is to determine the budget of internet marketing communication. For example, when it comes to websites, they can be extremely cost effective and efficient, but the real cost of developing and updating a quality site can be high (Broderick and Pickton, 2005). Yet, as is often the case with public relations, online marketing communication is sometimes considered free (Broderick and Pickton, 2005). It is important for companies to be aware of the potential costs of this form of communication when choosing the internet as a medium. If a company chooses to communicate online, it is necessary to consider what form of the message will produce the best results. Whether the message is formal, informal, written, visual, or combined depends largely on the target group. When the decision is made to use the internet as a medium of marketing communication, the challenge is the decision to use other media. The combination depends on various aspects, so it is extremely important to conduct research that will answer the question about multimedia. Integrated marketing communication refers to the use of multiple tools, so when using the internet, it is also important to determine whether it is integrated internet marketing communication or whether only one communication tool will be used. So the company has to decide between social networks, online public relations, Google ads, a website or a combination of these and other tools.

2.4. Changes

The development of technology has brought a number of changes to the world and has thus affected marketing. The change category poses the challenge of: adapting to the changing buying process, the challenge of adapting to a changing set of marketing skills (Hofacker and Belanche, 2016), and the challenge of rapid technological change (Quraishi et al., 2017). The traditional buying process is usually described through several typical phases, which change with the advent of online purchasing. The traditional steps according to Hofacker and Belanche (2016) are: problem recognition, search, evaluation, purchase, post-purchase evaluation. With the development of social networks, the act of consumption becomes public, and as such it must be included in the above steps. Consumers share their experiences in the form of photos and videos, whether in restaurants, shops or other places of consumption. Companies need to be aware of this step, but also of a new approach to post-purchase engagement that includes reviews and other ways of disseminating business information (Hofacker and Belanche, 2016). Internet marketing communication requires continuous monitoring of trends and changes, which is why it is challenging for companies to adapt to a set of new marketing skills. Theoretical knowledge is only the foundation of internet marketing, and professionals need the skills to use new tools and study digital data, which is important to companies, except in textual, image and video formats (Hofacker and Belanche, 2016). Companies are faced with the challenge of rapid technological change, which constantly needs to be kept up to date, and often

only ahead of time. Changes require constant attention and management so that the company does not use outdated marketing strategies (Quraishi et al., 2017).

2.5. Security

Although systems are constantly being promoted for improving internet security, this category is still a challenge for internet marketing communication. In doing so, it consists of challenges relating to: trust (Broderick and Pickton, 2005), others' fraudulent (fake) activities (Quraishi et al., 2017) and data protection (Chaffey et al., 2009, p. 137). From former push promotional strategies, the development of online marketing communication has resulted in a trust-based promotion (Dehghani and Tumer, 2015). Such online marketing communication is needed because of the conservative nature of customers who do not trust online sales, which is a major stumbling block for companies (Broderick and Pickton, 2005). Many customers still use the internet solely to inform the product, but prefer to buy it in physical stores (Quraishi et al., 2017). This is a problem of intangibility, and it is up to companies to overcome this challenge with potential new solutions. The biggest drawback to internet marketing according to Quraishi et al (2017) is the vulnerability due to fraudulent activities. This applies to hackers as well as to public activities such as fake websites that can mislead customers and thus affect the companies and image of companies. Companies also face click fraud in frequently used pay per click campaigns. Because a company pays for each click on an ad, competitors can organize deliberate ad opening, which can cause huge costs (Stokes, 2009). Therefore, it is important to continually monitor the campaign and report any suspicious activity on time. Every company needs to be well versed in data protection laws and regulations since any failure to do so is detrimental to consumers and thus potentially to the image of the company. But, because it is a complex area with frequent changes, policy monitoring and compliance is a challenge of internet marketing communication, which must be based on data protection. This refers to socially acceptable ethical behavior, the use of which can prevent potential losses arising from non-compliance with laws and regulations. In order for companies to comply with data protection and privacy laws, they must properly collect, store, use and delete personal information (Chaffey et al., 2009, p. 137), since these laws address more thoroughly all internet tools marketing communications, monitoring and following them can be a challenge for companies.

2.6. Characteristics of internet marketing communication

Although internet marketing communication is characterized by features that often present advantages over traditional ones, these characteristics can also present challenges. This category thus presents challenges related to loss and response (Quraishi et al., 2017), creating attractive and profitable interactions (Hofacker and Belanche, 2016), technology dependency (Quraishi et al., 2017), automated interactions (Leeflang et al.., 2014), a bilateral mode of communication (Abashidze, 2017), internet saturation (Stokes, 2009), and search (Broderick and Pickton, 2005). Internet marketing communication can manifest itself in losses in terms of poor consumer response. It is normal for certain losses to exist, but the goal of such communication should still be interactivity. In order to avoid excessive losses, the company should apply an accurate targeting strategy before initiating communication. This is done using parameters such as location and keywords, and losses can also be avoided by eliminating constraints on interaction creation (Quraishi et al., 2017). In internet marketing communication, it is possible to combine audio and video technologies to present the message with sound, music and image (Quraishi et al., 2017). It is important that the message is attractive in order to be profitable, and for this purpose to make good use of interaction based on techniques and game elements. Such an approach results in a hedonistic experience with rapid response, clear goals, and undisturbed communication (Hofacker and Belanche, 2016).

Although the technology of marketing communication has many advantages, the dependency of internet marketing communication has its disadvantages. This refers to failures and errors that, regardless of progress, occur with technological devices. An example of such an error is when a potential buyer opens an ad, but a technical failure does not allow the purchase of the product. The prospective buyer is likely to make their purchase with a competitor because of dissatisfaction (Quraishi et al., 2017). When planning online marketing communications, the company should consider the automated interaction option and the real interaction option. The decision, on the one hand, depends on the characteristics of the company and the product, and on the other, on the characteristics of the target group. In any case, automated customer interaction management services can lead to customer dissatisfaction and thus undermine the value that the company provides them (Leeflang et al., 2014). As consumers on the internet take an active role in communicating with companies, this changes the type of communication from traditional monologues used by companies to reach consumers, to bilateral communication in which consumers play an important role. Regardless of customer loyalty, there is always a risk of unexpected behavior, so companies need to choose the right communication style (Abashidze, 2017). It is up to them to overcome the challenge of the bilateral mode of communication and to discover the benefits that such marketing communication brings. Using the internet, one receives a great deal of information in a short period of time as it is presented with different contents. The internet is saturated with various forms of internet marketing communication and is increasingly ignored by consumers (Stokes, 2009). As more and more companies use the internet as a medium, there is a problem of standing out from the competition. Nevertheless, a proactive internet search that characterizes many consumers increases the likelihood of visiting a company website (Broderick and Pickton, 2005), and so does the likelihood of responding to communication. It is the saturation of the internet that makes it difficult to search, so companies need to make sure they are in a good position among the results. Particularly for casual users, searching for certain information or websites can be difficult, time consuming and frustrating (Broderick and Pickton, 2005). However, with the saturation of the internet, search engine optimization and content optimization tools have emerged that allow companies to stand out. It is important to continuously monitor the position of the company in order to optimize it in a timely manner.

3. RESEARCH

By researching and analyzing existing literature (secondary data) we have highlighted the characteristics of internet marketing communication that pose potential challenges for companies. In order to gain new insights into the extent to which of these challenges arise, empirical research has been conducted. We conducted two researches, one among customers and the other among managers of marketing agencies on the Croatian market. In order to present the results as precisely as possible the answers to the research topic, two comparable questionnaires as instruments of primary data collection were created. A consumer survey (non-probability sampling, snowball sampling) was published on social networks in three rounds. A total of 228 consumers accessed the questionnaire, and 113 of them fully answered all the questions and a statistical analysis was presented on their answers, as shown below. During the same period, 107 marketing agencies (non-probability sampling, judgmental sampling) were contacted via e-mail, of which 11 fully completed survey questionnaires were collected and the analysis of the answers is presented below.

Table following on the next page

CHALLENGES FOR THE COMPANIES	EXAMINEE	1 It never presents a challenge	2 It rarely presents a challenge	3 Sometimes it presents a challenge	4 It often presents a challenge	5 It always presents a challenge	9 Don't know/don't want to answer/ can't answer	Medium grade
Investigating and monitoring of the characteristics, desires and needs of consumers through the internet.	Number of experts (N=11)	0	1	4	1	**5**	0	**3,91**
	Percentage of consumers (N=113)	5,42%	21,24%	26,55%	**30,09%**	16,81%	0,88%	**3,34**
Detecting of cultural factors that affect consumer characteristics related to internet use.	Number of experts (N=11)	0	2	**6**	3	0	0	**2,82**
	Percentage of consumers (N=113)	6,19%	10,62%	33,63%	**36,28%**	11,50%	1,77%	**3,73**
The redefinition of traditional target groups into those groups created by the emergence of social networks.	Number of experts (N=11)	1	2	**4**	2	2	0	**3,18**
	Percentage of consumers (N=113)	3,54%	8,58%	**38,05%**	30,09%	12,39%	7,08%	**3,42**
Communication with different generations of people on the internet.	Number of experts (N=11)	1	**4**	3	3	0	0	**2,73**
	Percentage of consumers (N=113)	4,42%	12,39%	24,78%	**30,97%**	24,78%	2,65%	**3,61**

Table 1: Opinions of experts and consumers regarding target group as an internet marketing communication challenge
(Source: research)

According to research results shown in table 1, opinions of experts and consumers regarding target group as an internet marketing communication challenge differ the most when we asked them about cultural factors. Experts have an average rating of 2.82, so it can be concluded that, on average, they agree that the challenge of cultural factors affecting consumer characteristics related to internet use for companies occurs sometimes, and consumers on average (3.73) find that challenge often common. Also when we asked them about the challenge of communicating with different generations of people on the internet, experts' most frequent response to that challenge was "rare", with an average score of 2.73, and consumers on average find this to be a more common challenge for companies with average grade 3.61. And on other two challenges related to target group and detected in secondary data research (investigating and monitoring of the characteristics, desires and needs of consumers through the Internet and the redefinition of traditional target groups into those groups created by the emergence of social networks) experts and consumers do not have so much different opinions.

CHALLENGES FOR THE COMPANIES	EXAMINEE	1 It never presents a challenge	2 It rarely presents a challenge	3 Sometimes it presents a challenge	4 It often presents a challenge	5 It always presents a challenge	9 Don't know/don't want to answer/ can't answer	Medium grade
Tracking of content about a business, brand or product created by consumers on the internet.	Number of experts (N=11)	1	**5**	2	2	1	0	**2,73**
	Percentage of consumers (N=113)	9,73%	24,78%	**26,55%**	25,66%	12,39%	0,88%	**3,06**
Managing of content about a business, brand, or product created online by consumers.	Number of experts (N=11)	0	3	2	2	**4**	0	**3,64**
	Percentage of consumers (N=113)	4,42%	17,70%	**30,97%**	**30,97%**	13,27%	2,65%	**3,32**
Tracking of consumer reviews on the internet.	Number of experts (N=11)	**6**	3	0	2	0	0	**1,82**
	Percentage of consumers (N=113)	10,62%	**27,43%**	26,55%	22,12%	12,39%	0,88%	**2,98**
Managing of online consumer reviews.	Number of experts (N=11)	1	**4**	2	1	3	0	**3,09**
	Percentage of consumers (N=113)	5,31%	19,47%	**29,20%**	23,89%	19,47%	2,65%	**3,37**

Table 2: Opinions of experts and consumers regarding consumer activities as an internet marketing communication challenge
(Source: research)

In previous table we can see that opinions of experts and consumers about consumer activities as an internet marketing communication challenge are the most different according to tracking of consumer reviews on the Internet. The average rating of the examined experts is 1.82, which indicates that, in their opinion, monitoring reviews is rarely a challenge for their companies, on the other hand, consumers with an average grade of 2.98 find that this challenge sometimes occurs for companies. Also, it is important to note that the most common response from experts (6 experts) was: tracking of consumer reviews on the internet "never presents a challenge". On other detected challenges according to consumer activities on the internet we find no greater differences in opinions of experts and consumers.

Table following on the next page

CHALLENGES FOR THE COMPANIES	EXAMINEE	1 It never presents a challenge	2 It rarely presents a challenge	3 Sometimes it presents a challenge	4 It often presents a challenge	5 It always presents a challenge	9 Don't know/don't want to answer/ can't answer	Medium grade
Managing of a brand on the internet	Number of experts (N=11)	0	3	1	**5**	2	0	**3,55**
	Percentage of consumers (N=113)	5,31%	14,16%	**36,28%**	29,20%	10,62%	4,42%	**3,30**
Reactive management of internet marketing communication.	Number of experts (N=11)	0	1	**5**	**5**	0	0	**3,36**
	Percentage of consumers (N=113)	2,65%	10,62%	**45,13%**	30,09%	4,42%	7,08%	**3,25**
Building consumer relationships online vs. building relationships in live environment.	Number of experts (N=11)	1	1	**6**	2	1	0	**3,09**
	Percentage of consumers (N=113)	5,31%	18,58%	28,32%	**32,74%**	14,16%	0,88%	**3,32**
Tracking and measuring of communication results in online environment.	Number of experts (N=11)	3	1	**3**	2	2	0	**2,91**
	Percentage of consumers (N=113)	10,62%	23,01%	27,43%	**30,09%**	8,85%	0,00%	**3,04**
Managing of pay per click campaigns on the internet.	Number of experts (N=11)	2	**4**	3	1	1	0	**2,55**
	Percentage of consumers (N=113)	11,50%	18,58%	**29,20%**	19,47%	14,16%	7,08%	**3,07**
Setting and managing of a budget online.	Number of experts (N=11)	2	3	**4**	1	1	0	**2,64**
	Percentage of consumers (N=113)	7,08%	12,39%	**33,63%**	30,09%	15,04%	1,77%	**3,34**
Formatting a message on the internet.	Number of experts (N=11)	1	**7**	1	1	1	0	**2,45**
	Percentage of consumers (N=113)	7,96%	13,27%	**35,40%**	28,32%	10,62%	4,42%	**3,21**
Selecting of (traditional) media in addition to the internet.	Number of experts (N=11)	1	**4**	**4**	2	0	0	**2,64**
	Percentage of consumers (N=113)	3,54%	21,24%	**36,28%**	28,32%	9,73%	0,88%	**3,20**
Selecting and using of multiple tools of integrated internet marketing communication.	Number of experts (N=11)	0	2	**7**	1	1	0	**3,09**
	Percentage of consumers (N=113)	3,54%	13,27%	**38,94%**	23,89%	16,81%	3,54%	**3,39**

Table 3: Opinions of experts and consumers regarding management of internet marketing communication as a challenge
(Source: research)

According to results shown in table 3, regarding of management of internet marketing communication as a challenge detected by research of secondary data, differences between opinions of experts and consumers are not so big. In average their opinions about managing of a brand on the internet (experts 3.55, consumers 3.30) are not so much different.

Experts consider brand management on the internet a common challenge of internet marketing communication for companies they work for, and consumers on average find that this challenge sometimes occurs for companies. The average rating of the examined experts about reactive communication management is 3.36, so in their opinion on average it sometimes presents a challenge of internet marketing communication. From another perspective, consumers are, on average (3.25) quite aware of the frequency of this challenge for companies. The most common response of experts for building consumer relationships online vs. building relationships in live environment as a challenge of Internet marketing communication is “sometimes,” and so their average score is 3.09, which suggests that, in their opinion, building relationships sometimes presents a challenge for internet marketing communication. The most common answer (32.74%) of consumers is "often", but their average (3.32) coincides with the experts' answers. In addition, the average rating of the experts (2.91) and consumers (3.04) about tracking and measuring of communication results in online environment is, which indicates that for them, on average, this detected challenge occurs sometimes. The average rating of the experts (2.55) and of consumers (3.07) means that managing of a pay per click campaign on average sometimes occurs as a challenge of internet marketing communication. Experts, on average (2.64), find that the budgeting sometimes occurs as a challenge of internet marketing communications for companies, and consumers (3.34) consider this challenge to be somewhat more common on average. And the most common answers from both experts and consumers are “sometimes”. The most common response of experts (7 of 11) to the challenge of message formulation is "rare", while the largest percentage of consumers (35.40%) believe that this challenge sometimes occurs for businesses. The average rating of the experts (2.64) indicates that in their opinion multimedia is sometimes a challenge of internet marketing communication for companies. From a consumer perspective, this is a more common challenge, but on average (3.20), they, as well as experts, find that choosing additional media over the internet sometimes presents a challenge for companies. And the last detected challenge in a group of management internet marketing communication challenges is connected with selecting and using of multiple tools of integrated internet marketing communication. The average rating of the experts is 3.09, which indicating that in their opinion this sometimes presents a challenge for companies, and consumers (3.39) are quite aware, on average, of the frequency of occurrence of this challenge.

Table following on the next page

CHALLENGES FOR THE COMPANIES	EXAMINEE	1 It never presents a challenge	2 It rarely presents a challenge	3 Sometimes it presents a challenge	4 It often presents a challenge	5 It always presents a challenge	9 Don't know/don't want to answer/ can't answer	Medium grade
Adaptation to communication related to online shopping.	Number of experts (N=11)	1	**6**	0	4	0	0	**2,64**
	Percentage of consumers (N=113)	4,42%	12,39%	**36,28%**	31,86%	14,16%	0,88%	**3,39**
Adaptation to a changing set of marketing skills.	Number of experts (N=11)	1	3	**4**	2	1	0	**2,91**
	Percentage of consumers (N=113)	1,77%	18,58%	29,20%	**33,63%**	14,16%	2,65%	**3,41**
Monitoring technological changes and decision making related to them.	Number of experts (N=11)	0	2	4	**5**	0	0	**3,27**
	Percentage of consumers (N=113)	6,19%	13,27%	**33,63%**	31,86%	15,04%	0,00%	**3,36**

Table 4: Opinions of experts and consumers regarding changes as an internet marketing communication challenge
(Source: research)

From the results shown in table 4, regarding changes as an internet marketing communication challenge, we can see that also in this group of challenges opinions of experts and consumers are similar. The average rating of the experts (2.64) and consumers (3.39) about adaptation to communication related to online shopping as a challenge is, suggesting that, in their view, adapting to the changing purchasing process sometimes presents a challenge for companies. It is also interesting that 6 of 11experts consider this challenge rare, while 4 of them consider this challenge often. The average rating of the examined experts about adaptation to a changing set of marketing skills is 2.91, which indicates that on average they find this challenge sometimes present for companies. Consumers also on average (3.41) find this challenge somewhat more common, and the mean score about this challenge matches the average rating of the experts. And the last challenge in this group shows that on average opinions of experts and consumers are similar. The average rating of the experts is 3.27, and consumers 3.36 which indicates that, on average, monitoring technological changes and decision making related to them sometimes presents a challenge for companies.

Table following on the next page

CHALLENGES FOR THE COMPANIES	EXAMINEE	1 It never presents a challenge	2 It rarely presents a challenge	3 Sometimes it presents a challenge	4 It often presents a challenge	5 It always presents a challenge	9 Don't know/don't want to answer/ can't answer	Medium grade
Intangibility and consumer confidence.	Number of experts (N=11)	0	1	2	**7**	1	0	**3,73**
	Percentage of consumers (N=113)	5,31%	7,96%	22,12%	**37,17%**	25,66%	1,77%	**3,71**
Other people's fake activities.	Number of experts (N=11)	0	2	**4**	2	3	0	**3,55**
	Percentage of consumers (N=113)	3,54%	11,50%	27,43%	**28,32%**	27,43%	1,77%	**3,66**
Monitoring of data protection and behavior regulation according to them.	Number of experts (N=11)	2	2	3	0	**4**	0	**3,18**
	Percentage of consumers (N=113)	5,31%	14,16%	25,66%	**28,32%**	19,47%	7,08%	**3,46**

Table 5: Opinions of experts and consumers regarding security as an internet marketing communication challenge
(Source: research)

From table 5 we can see that the biggest difference between the opinions of experts and consumers refers to monitoring of data protection and behavior regulation according to them when we look at a group of challenges connected with security. The mean grade of the experts is 3.18, which indicates that on average they think that data protection sometimes occurs as a challenge for the companies they work for, but it should be emphasized that response dispersion indicates a large standard deviation. Also, consumers are on average (3.46) aware of the frequency of this challenge and they (28,32%) think that in general this often presents a challenge for companies. For the other two challenges in this group (intangibility and consumer confidence and other people's fake activities) examined experts and consumers gave on average similar grades. Although, the average rating of the experts regarding the challenge of other people's fake activities is 3.55, which indicates that, on average, the experts consider this challenge frequent. However, the distribution of data suggesting a large standard deviation should also be considered, so the mean score should be taken with caution. Consumer responses are also fairly divided, with a mean score of 3.66 showing that consumers surveyed consider the challenge of other people's fraudulent activities to be frequent.

Table following on the next page

CHALLENGES FOR THE COMPANIES	EXAMINEE	1 It never presents a challenge	2 It rarely presents a challenge	3 Sometimes it presents a challenge	4 It often presents a challenge	5 It always presents a challenge	9 Don't know/don't want to answer/ can't answer	Medium grade
The loss of not getting a response from a consumer**.**	Number of experts (N=11)	1	1	2	**4**	3	0	**3,64**
	Percentage of consumers (N=113)	6,19%	13,27%	24,78%	**38,94%**	13,27%	3,54%	**3,41**
Creating attractive, yet profitable customer interactions.	Number of experts (N=11)	0	3	1	**5**	2	0	**3,55**
	Percentage of consumers (N=113)	3,54%	12,39%	**30,97%**	**30,97%**	19,47%	2,65%	**3,52**
Communication dependencies on technology as a key intermediary for internet use.	Number of experts (N=11)	2	1	**5**	3	0	0	**2,82**
	Percentage of consumers (N=113)	4,42%	15,93%	**35,40%**	29,20%	11,50%	3,54%	**3,28**
Managing of automated online interactions.	Number of experts (N=11)	3	**4**	3	0	1	0	**2,28**
	Percentage of consumers (N=113)	4,42%	19,47%	26,55%	**30,09%**	10,62%	8,85%	**3,25**
Bilateral ways of communication between consumers and businesses via the internet.	Number of experts (N=11)	2	**5**	3	1	0	0	**2,27**
	Percentage of consumers (N=113)	0,88%	19,47%	**33,63%**	23,89%	11,50%	10,62%	**3,29**
Internet saturation.	Number of experts (N=11)	2	1	1	3	**4**	0	**3,55**
	Percentage of consumers (N=113)	7,96%	8,85%	25,66%	**33,63%**	21,24%	2,65%	**3,53**
Content and search engine optimization.	Number of experts (N=11)	3	1	1	**4**	2	0	**3,09**
	Percentage of consumers (N=113)	4,42%	12,39%	25,66%	**33,63%**	23,01%	0,88%	**3,59**

Table 6: Opinions of experts and consumers regarding characteristics as an internet marketing communication challenge
(Source: research)

From the results shown in the last table we can see that the opinions of experts and consumers also are not so different as they might be. So, in general experts and consumers agree that on average the creating attractive yet profitable customer interactions, communication dependencies on technology as a key intermediary for internet use, internet saturation presents the same challenge for both experts and consumers. And on the other hand, the average rating of the experts when we look at the loss due to response as a challenge is 3.64, and the average rate of consumers is 3.41 which means that experts often find this as a challenge for companies they work for, and their consumers think this sometimes presents a challenge for that same companies. Automated interaction management on average experts (2.28) consider as a rare challenge and distribution of consumer responses compared to expert responses indicates that consumers find this challenge to occur more frequently, and thus their average score is 3.25. This means that, on average, consumers find that this challenge for businesses occurs sometimes. The average of the examined experts when looking at bilateral communication as a challenge is 2.27, which indicates that the experts consider this challenge rare. Consumers, on the other hand (3.29), find that this challenge comes up more often than experts. The opinions of the experts regarding the emergence of the challenges of content optimization and search engine diverge optimization, that are shown in this table, indicates that on average experts think that content optimization sometimes presents a challenge for companies, and consumers (3.59) consider this challenge to occur more frequently.

4. CONCLUSION

This paper is based on a field closely related to technological development, which is of utmost importance for modern companies. The paper deals with the field of internet marketing communication and the challenges companies can occur with by doing business in online environment. By systematically summarizing the literature, six categories of potential challenges were identified, and both empirical research was based on them. The research found that the challenges identified were based on various features of internet marketing communication, but also on general marketing influencing events. Conducting research into two groups, one consisting of consumers and the other marketing professionals, ensured significant data collection. The data were processed by descriptive statistics, which showed that experts are well aware of consumers when it comes to internet marketing communications, but also that consumers are well versed in this area when considering potential challenges for companies. According to experts, the most common challenges for companies are monitoring the characteristics, desires and needs of consumers online, the use of ad blockers and / or pop-up blockers by consumers, consumer distrust, the loss of not receiving consumer responses, and the challenge of managing content about a company, brand, or product created by consumers on the internet. On the other hand, the most common challenges are the challenge of monitoring consumer reviews on the internet, the challenge of message formatting, the challenge of managing automated online interactions, and the challenge of bilateral communication between consumers and companies via the internet. At the same time, the opinions of consumers and companies are only slightly different, which indicates the consumer's awareness of the topic of internet marketing communication. In addition to the classical empirical research, the paper went a step further, providing data that reflects more than the current challenges of internet marketing communication. It has been revealed whether experts but also consumers can be put in the opposite position and how skilled they are. Therefore, this work can serve as a significant basis for further research, which would include, in addition to descriptive, detailed statistical analyses. In addition, all the results obtained can be used as a basis for research and business decision-making related to internet marketing communication.

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SMART AGRICULTURE AND ERP BENEFITS IN THE CONTEXT OF DIGITAL TRANSFORMATION

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ABSTRACT

Enterprise Resource Planning (ERP) systems are designed to support operational processes in the organization and ensure more efficient and quality business performance. Although the ERP implementation is a demanding project, it is well known that organizations investing in ERP systems, achieve many benefits. In current business trends, ERP systems are considered as main source of business data for successful company management and common ground for Digital Transformation (DT) of modern enterprise. Digital Transformation paradigm indicates the importance of these systems, which become the basis for data collection and allocation during transformation. Smart Agriculture uses emerging technologies of Industry 4.0 to provide automation, real-time data, prediction and management of agricultural business which extend the standard production, sales, procurement and inventory management processes. This paper deals with literature review on ERP benefits and questions ERP usefulness, in the Digital Transformation era, process improvement and enrichment by emerging technologies in the field of agriculture. In the context of Digital Transformation, the adaptation of ERP systems is needed to ensure that organizations can enhance their digital capabilities and create the preconditions for innovation and Smart Agriculture.

Keywords: *ERP Systems, Digital Transformation, Smart Agriculture, Benefits*

1. INTRODUCTION

Enterprise Resource Planning (ERP) systems are business information systems designed to provide complete control of business processes in organization. Their emergence was recorded during the 1990s, with the development of simple applications into customizable software systems. ERP systems apply and integrate various business functions in organizations (among others, accounting, human resources, customer relationship, sales, purchasing, distribution) (Hamundu, Wibowo & Budiarto, 2012), (de Araújo Santos, Lima & Filho, 2010) so that each employee has access to relevant information at any time (Gattiker & Goodhue, 2004). As far as databases is concerned, ERP uses logically a single database for data entry, recording, processing and monitoring, ERP encompasses all functions and departments within an organization and enhances interdepartmental collaboration and coordination among them (Hamundu, Wibowo & Budiarto, 2012). This eliminates redundancies and input errors, while the reporting function is easily achieved (Murphy & Simon, 2002). The purpose of an ERP system is to create a more optimal business process that will deliver potential savings and affect

final productivity (Koh, Gunasekaran & Rajkumar, 2008). The implementation of ERP systems enables organizations to move to an expanded business model that will increase value across the supply chain (Kelle & Akbulut, 2005). Greater interdependence of organizational units is closely related to the benefits of implementation, while differentiation is correlated with high costs of an ERP project (Gattiker & Goodhue, 2004). Due to its complexity, high costs and a strict timetable, ERP implementation is a very risky project (Ahituv, Neumann & Zviran, 2002) and it often combines the implementation of a new information system with business process redesign. The recent emergence of Industry 4.0, which emphasizes a focus on collecting, analysing and deploying large data sets to improve business efficiency, calls into question the functionality and obsolescence of standard ERP systems. For this reason, individual organizations have begun to move from a standard system that essentially captures and collects data to systems that enable engagement, notification and decision support, referred to as intelligent ERP systems (i-ERP) (Trillium Network for Advanced Manufacturing, 2020). Given that information and communication technologies (ICTs) influence the improvement of business processes (Ellram & Zsidisin, 2002), the question is how to manage and improve the business of the entire organization. One way of empowering organizations and achieving competitiveness in the market is certainly the Digital Transformation (DT) of businesses. Guided by changing business models and processes and focusing them on improving the customer experience, it is one of the more complex projects of organizations (Kutnjak, Pihir & Tomičić Furjan, 2019). DT and the application of technological innovations have made it possible to connect with customers at different levels - from exchanging information about satisfaction and the buying process to helping with the purchase itself or custom-made pick-up. The initial approach to the transformation process is, among other things, seen in the analysis of large amounts of data and their efficient utilization. This is where ERP systems come to the fore, as collectors and providers of relevant data in the DT process. In the context of Digital Transformation agriculture advanced to a broader use of Industry 4.0 technologies in order to become Smart Agriculture or Agriculture 4.0 (Lezoche al, 2020), (Mazzetto, Gallo & Sacco, 2020). These new concepts use all available Industry 4.0 technologies such as Big Data et., Internet of Things (IoT), Artificial Intelligence (AI), Cloud Computing (CC), Blockchain and other emerging technologies to support among other Precision and Smart Agriculture development. This all together digitally transforms farming and food production with supporting the whole supply chains (Lezoche et al, 2020), (Agrawal & Kamboj, 2019), (Zaripova et al, 2019). In that sense, this research systematizes benefits for Smart Agriculture and its digital transformation with use of / relying on ERP systems as a base ICT support in business processes extended with large use of emerging technologies of Industry 4.0. When implementing any complex information system, it is necessary to consider the profitability of such investment. As the role of information technology (IT) is steadily increasing and occupying a central place in business, it is questioned what are the resources that organizations are willing to invest in IT assets, and what are the benefits of such investments (Johansson et al, 2016). The aim of this research is to identify the two previously mentioned parameters - costs and benefits, through Cost-Benefit Analysis (CBA) when implementing ERP projects. CBA allows companies to compare the expected cost of the investment and its benefits. If the costs are balanced with benefits, it is very likely that the organization will decide to implement the initiated projects (Chang & Hsu, 2017). The current market situation creates global competition that forces organizations to continually improve their performance (Hamundu, Wibowo & Budiarto, 2012) and to initiate competing projects. For this purpose, the Digital Transformation paradigm has also been considered, and in correlation with ERP. Accordingly, the role of ERP in the context of Digital Transformation of Smart Agriculture has been explored, with an insight into CBA. Research in this paper focuses on research questions related to (1) investigate which costs and benefits of implementing or owning an ERP system of any

kind (with support for key business functions, common database, integrated operation and availability of transactional data supporting key business processes) are reported in existing literature and (2) to contribute to the understanding which same or similar benefits occur in Smart Agriculture in time of Digital Transformation, i.e. the application of Industry 4.0 technologies. Additional research questions were dealing with the multiplication effect of benefits when ERP is used together with emerging technologies such as IoT, Big Data, Cloud Computing, AI and similar in field of agriculture. The paper is structured as follows. At the outset, a research methodology is defined. Next, the systematization of the conducted literature analysis enabled the identification of costs and benefits related to the implementation and use of ERP. The following chapter deals with ERP systems and its role in Digital Transformation, followed by the analysis of ERP role in Smart Agriculture extended with use of emerging technologies of Industry 4.0. Final results in following chapters show costs and benefits of ERP in general and additional benefits of ERP in of the context of Digital Transformation and use in Smart Agriculture with Industry 4.0 technologies.

2. RESEARCH METHODOLOGY

In order to gain insights into research related to benefits of ERP, Smart Agriculture and Digital Transformation, literature analysis was performed. Literature review was focused on published papers in journals and conference proceedings. The aforementioned papers were searched in the recognized databases and platforms such as: Scopus, Web of Science (WoS), IEEE and finally Google Scholar. The analysis was performed in two phases:

1. The first phase included papers searched by a complex query with keywords: "cost benefit" and "enterprise resource planning" or “ERP”; and in
2. The second phase additional analysis was made separately with same terms “cost benefit” and "enterprise resource planning" or “ERP” but this time with extension to additional terms “Digital Transformation” and “Smart Agriculture” without limiting the year of publication in both searches.

The mix of terms was also used to limit the number of hits and exclude non-valid research results. While all searched platforms gave some results additional criterion to include papers in this research was the relevance to topic of research. Furthermore, it was found that some results were found in several databases, i.e. platforms, while the basic analysis (abstract, introduction, conclusion) indicated that some papers were not related to the chosen research topic, which led to their exclusion from the analysis. Finally, the first phase of the literature review and research resulted with an analysis of 17 selected papers relevant to the implementation of ERP projects and a cost-benefit analysis. In the second phase the pool of papers was updated with addition of 18 new papers (1 is the same as in first phase) concerning also “Smart Agriculture” and “Digital Transformation”. This second phase literature review was conducted to review another research question related to the benefits of applying ERP systems in Smart Agriculture and its Digital Transformation.

3. COST-BENEFIT ANALYSIS OF ERP IMPLEMENTATION AND USAGE

Organizational managers are quite reserved when deciding to invest in ERP systems because of the high investment costs and complexity of the implementation process (Hamundu, Wibowo & Budiarto, 2012). Differentiation of subunits in an organization makes it difficult to ERP implementation, which leads to incompatibility of ERP with certain operational and information needs of subunits (Gattiker & Goodhue, 2004). In this way, design and trade-off costs are created, while in contrast, the high integration and standardization of ERPs increase the interdependence of organizational units, thereby improving sharing information, quality of service and cost savings (Kelle & Akbulut, 2005).

The most common motivation for implementing ERP is to replace the existing system, to automate and streamline business processes. Implementations focused on the entire structure of an organization and its business processes increase focus and lead to better financial results in a shorter period of time (Murphy & Simon, 2002). The implementation project is a comprehensive and complex process that involves high costs, a large number of human resources and a short timetable for activities. Organizations that strategically and structurally approach ERP implementation can achieve 10% savings in total IT costs within 5 years (Ahituv, Neumann & Zviran, 2002), and careful project planning and management can be a source of competitive advantage (Koh, Gunasekaran & Rajkumar, 2008). Successful justification of ERP implementation project requires a monetary assessment of its benefits and costs (Murphy & Simon, 2002). A common approach to identifying and evaluating investments is CB analysis (Johansson et al, 2016). It provides a comprehensive overview of the costs and benefits associated with an investment and allows for an assessment of the net investment benefits. In CB analysis, organizations include the Return on Investment (ROI) method, Net Present Value (NPV) and Internal Rate of Return (IRR) (Murphy & Simon, 2001) to quantify the value of their investments. As such, CB analysis provides an approach that, in addition to considering multiple criteria, also provides an efficiency standard for assessing and managing the key factors for (un)success of ERP implementation (Hamundu, Wibowo & Budiarto, 2012). When evaluating IT projects, it is more challenging to quantify and determine adequate financial value of some benefits. Although managers are often focused on quantitative results when they evaluating projects, which is understandable because of the large amount of capital investment, the increasing importance of intangible investments suggests that they need to be included in the assessment of implementation success (Murphy & Simon, 2002). For this reason, intangible measures need to be added to quantitative techniques (Hamundu, Wibowo & Budiarto, 2012) (such as influencing customer satisfaction, creating perceived value for business, facilitating decision making) in order for evaluation to be comprehensive (Johansson et al, 2016). Although all business disciplines face the issue of quantifying intangible benefits, it is important to include them in a comprehensive analysis to make the final assessment of investment results as accurate as possible (Murphy & Simon, 2001). The research found that organizations lacked the ambition to evaluate ERP investments and to quantify soft, intangible values. Organizations show structured monitoring of investment costs (Johansson et al, 2016), however they do not focus on the return on investment. Managers find it difficult to evaluate the success of ERP implementation, and if the value of the implementation is quantified, the accuracy and reliability of its evaluation will be questioned (Hamundu, Wibowo & Budiarto, 2012). It can be concluded that those organizations that track their return on investment and make a comprehensive assessment are rare. For companies to gain a competitive edge, they must define the correct way to verify the viability of IT investments. The results show that the traditional CB analysis method can be applied to large IT projects (such as ERP system implementation), but with the inclusion of intangible measures. Therefore, an enhanced and comprehensive analysis is provided that gives managers a more realistic view of the yield of introducing an ERP system into the business. In this way, intangible values are used as a complement to CB analysis, and it itself shows results that were not once considered measurable (Murphy & Simon, 2001). Successful and strategically planned investing in ERP shows a positive cost-benefit ratio, although it takes several years for capitalization of investments (de Araújo Santos, Lima & Filho, 2010).

4. ERP SYSTEMS IN THE CONTEXT OF DIGITAL TRANSFORMATION

Once implemented, the ERP system requires adaptation to market changes. The current digital era is questioning the features of an ERP system and its functionality. According to authors (Cocca et al, 2018) “ERP systems represent the central core of the entire suite of enterprise

systems and they are considered the backbone for the Industry 4.0 (Haddaraab and Elragala, 2015)". ERP is also driven by constantly changing customer needs and expectations (Kryvinska & Bickel, 2020).. Defining a strategic plan focused on new technology, people and processes (Sultana, Sabir & Shah, 2018) will enable the transformation of ERP into a system appropriate to the new digital age (Asprion, Schneider & Grimberg, 2018). Organizations accelerate their innovation processes (Menshikova, Piunova & Makhova, 2019) and make supply chains more flexible, while supporting role of ERP managing financial resources, creating new values and new business models (Križanić, Šestanj-Perić & Tomičić-Pupek, 2019) . The increasing amount of data (collected on social networks, mobile devices, based on various analytics) requires system compatibility with the ability to store them (Westerman & Bonnet, 2019) but also to process them in real time. ERP systems will need to deliver extensive solutions as part of the standard package, while on the other hand, the emphasis will be on its flexibility and adaptation to different organizational structures. In addition, the system needs to focus on taking on routine tasks, but also to focus on non-routine, analytical and creative activities aimed at end-user satisfaction (Aleš, 2017). ERP systems must enable users to better predict and plan business results (Chuong, Hung & Diep, 2019), define recommendations regarding best business decisions and process automation, that is, enable innovation at the level of customer experience, business processes and data (Morris et al, 2016). The task of business architects in companies is to be as involved as possible in planning the strategy of Digital Transformation (Singha, Klarner and Hess, 2019) in order to ensure the proper design of the entire system, but also the design of alternative configurations (Babar & Yu, 2015). ERP systems, adequate to the digital age, must enable access to information through multiple information systems, information general exchange and integration with other applications (Williams and Schubert, 2018) , systems (Temel & Ayaz, 2019) and modern package solutions (Sotnyk et al, 2020) within the company (Strutynska et al, 2019). Such integration will enable the creation of a modern business tool (Sotnyk et al, 2020) that will be more responsive to the needs of the company, and will allow precise adaptation of business operations and improved the integration of data and processes. In addition to the internal integration of the system, the importance of the integration of the ERP system of business partners is emphasized (Ghannam et al, 2019) for the purpose of global coordination and mutual harmonization of production (Kilimis et al, 2019). Current ERP market trends are Cloud ERP and Internet of Things (IoT) ERP. Cloud ERP, because it reduces the costs of ERP suppliers, allows for easy upgrades, easier access and centralized control (Hartley & Sawaya, 2019), while the integration of IoT into ERP could promises to affect the collection of highly relevant data for the company with the ability to visualize them (Sokač & Picek, 2019) . In order for the system to function satisfactorily, it is necessary to implement the necessary ERP changes before implementing technologies that will use ERP data (Hartley & Sawaya, 2019), with an emphasis on the holistic application of the ERP system (Kilimis et al, 2019). Intuitiveness, easy understanding, rapid implementation, meeting standard customer needs, monitoring changes in technology and market demands (Aleš, 2017), are characteristics of ERP systems that must be met in the new digital age supporting and enabling the Digital Transformation of modern companies.

5. ERP, EMERGING TECHNOLOGIES, INDUSTRY 4.0 AND SMART AGRICULTURE

According to major trends in Digital Transformation of agriculture (Zaripova et al, 2019) and similar papers (Asprion, Schneider & Grimberg, 2018), (Mazzetto, Gallo & Sacco, 2020), Smart Agriculture with use of Industry 4.0 technologies and integrated ERP solutions incorporates benefits of technology to improve management efficiency, creation, scheduling and aggregation of data flows to create end-to-end chains from production to consumption. Smart agriculture, Precise Agriculture and Smart Farming improve food production and safety

(Mazzetto, Gallo & Sacco, 2020), (Agrawal & Kamboj, 2019), (Zaripova et al, 2019). These concepts use government data, open data, ERP processed data, other data gathered through sensor networks or provided from supply chain partners in order to increase business efficiency and process automation, improved product capacity and quality (Balakrishna Reddy & Ratna Kumar, 2020), (Lin et al, 2018). The Smart Agriculture industry is in front of many challenges, especially in use of ERP systems (Kulikov et al, 2020) but integrated with Industry 4.0 technologies gives benefits that make major transformation in, this, sometimes-neglected, industry field of agriculture, food production and makes it one of most perspective areas of human progress (Zaripova et al, 2019), (Lezoche et al, 2020). According to the perception of farmers (Haberli Junior et al, 2019), agricultural sector in general is positive towards expected benefits of both ERP and Industry 4.0 technologies integration and willing to invest together with the national governments with the intention to allow multiplication benefits in field of Smart Agriculture (Agrawal & Kamboj, 2019), (Mazzetto, Gallo & Sacco, 2020), (Kulikov et al, 2020), (Zaripova et al, 2019).

6. RESULTS OF LITERATURE REVIEW ON COST AND BENEFITS OF ERP

In further lines cost and benefits are synthesized (see Table 1) briefly describing core contribution of each paper (Cost / Benefits); ordinal number of papers in sample (N=17) e.g. "01"; reference number in literature e.g. (Hamundu, Wibowo & Budiarto, 2012); and type of source paper research (CS /OSP). Also, if applicable number of analysed case studies or number of respondents in specific study "N=xx".

Table 1: ERP implementation cost and benefits

Paper No / Source	Costs	Benefits
Paper 01 / (Hamundu, Wibowo & Budiarto, 2012) OSP	High investment cost and complexity of integration; in the CB analysis, one-time and ongoing costs occur: (1) the cost of installing hardware, software and adapting them to the organization, (2) the cost of controlling data, inventory records, bills and instructions, (3) education costs that include internal and external experts.	ERP affects customer satisfaction, accuracy and information flow, availability of financial calculations, and helps to develop organizational strategies. In the CB analysis, benefits were seen through increased revenue and cost savings (supplies, materials, labour); cost reduction due to lower error rate in ordering, manufacturing and selling products.
Paper 02 / (Gattiker & Goodhue, 2004) CS	Costs related to differentiation of organizational units and adaptation of the system; cost of qualified staff (employees and external consultants); time spent analysing problems and potential solutions.	Timely monitoring of finished goods inventory; increasing responsibility and self-discipline at the plant; improved of customer orders; elimination of repeated data entries; debugging calculations; report generation.
Paper 03 / (Murphy & Simon, 2002) CS	Cost of introducing and implementing an ERP system; the cost of developing and adapting the system; in paper used net present value (NPV), internal rate of return (IRR) and payback period for cost estimates.	ERP intangible benefits (1) internal improvement and infrastructure investment; (2) customer-focused services, (3) spotting and forecasting trends; (4) adaptability to change. ERP initially improves customer satisfaction (CS) by 5% and further 2% annually; increase in CS leads to a 1% increase in market share; in first year.
Paper 04 / (Koh, Gunasekaran & Rajkumar, 2008) OSP	/	Process automation, productivity growth; product/service quality; better planning, resource management, financial control; ability to support business growth and competitive advantage; benefits from IT infrastructure by reducing IT maintenance costs, increasing business flexibility; learning and staff empowerment, optimal work patterns, building a common vision.
Paper 05 / (Kelle & Akbulut, 2005) OSP	Investing in an inadequate information system; an organizational culture and structure that is not ready to accept the new system; personnel education costs.	Adding value in supply chain; information availability on production; schedules, deliveries; order status; better service; real-time monitoring; process integration.

Paper 06 / (Byrne & Heavey, 2006) CS	Costs arising from the non-sharing of information between stakeholders in the supply chain; costs of inadequate inventory management without the implementation of an ERP system.	Simplifying unstructured processes; improving the exchange of information within the supply chain; increasing savings across the supply chain up to 9.7%; increasing distributor savings up to 6.3%.
Paper 07 / (Velcu, 2007) CS N=8	Inability to identify quantitative indicators in the implementation of an ERP system that as such affects the financial performance of organizations (in addition to the implementation of the system, other structural changes occur, making it difficult to assess the contribution of the ERP to the financial results); organizations expect indirect financial impacts at the cost level.	Better decision-making; adaptation to business environment changes; transparency and business processes management, improved access to information; benefits for the customer in enhanced services, faster reporting; the benefits of learning internal processes and process stakeholders and growth of organizational knowledge of the system; cost reduction, increase in revenue, improved market value.
Paper 08 / (Ahituv, Neumann & Zviran, 2002) OSP	Cost of replacing existing infrastructure; cost of securing suitable staff; interruption costs made by system exchange.	Supplementing and improving support to functions and activities unique to organization; implementation allows 10% savings on total IT costs over five years.
Paper 09 / (Ellram & Zsidisin, 2002) CS N=261	Cost of procuring a system and selecting an appropriate ERP supplier; IT engagement cost and cost of internal and external data integration; data standardization; employees education.	Centralized control of information and processes; availability of information to everyone within the organization in real time; increasing productivity; accelerated growth of organizations.
Paper 10 / (Chang & Hsu, 2017) CS N=277	Risk and privacy issues manifested through cost.	Perceived usefulness (expected productivity and efficiency improvement) and perceived ease of use (new interface).
Paper 11 / (Leroux, Pupion and Sahut 2011) CS N=58	Employee training costs, hardware changes, and costs that result from staff resilience to adapting to new software.	Benefits in better business flow, integration and availability of information, decision-making assistance. Improved customer relationship, adequate customer response, increased organization flexibility, reduced costs and reduced inventory. Better business control, increased managerial expertise, process overhaul.
Paper 12 / (Johansson et al, 2016) CS	The cost of purchasing an ERP system accounts for 10% of the cost, while 90% relates to the additional costs of training employees, engaging consultants, increasing employment, etc.	Organizations view ERP implementation through CB analysis, adding intangible parameters to the analysis; ERP systems help employees work more efficiently every day, making them happier.
Paper 13 / (Goel, Kiran and Garg, 2013) CS	Authors identified 9 key costs in ERP implementation: training and interface development costs, technology cost, adaptation cost, update cost, integration cost, standardization and change management cost, risk management cost, routine monitoring cost, ERP consultant cost.	ERP systems are implemented to achieve technical and user benefits; benefits relate to organizational culture, competitiveness, stability and enhancement of employee skills, while customer benefits relate to security, greater satisfaction, better coordination and communication, better data quality and system flexibility.
Paper 14 / (Murphy & Simon, 2001) CS	Implementation costs in small organizations are approximately $ 10 million (implementation takes about 23 months), while in large organizations, implementation can exceed several hundred million dollars (with a duration of more than 5 years); cost estimate based on net present value (NPV), internal rate of return (IRR) and payback period;	Benefits in way of integration, standardization, real-time data accessibility, increased customer satisfaction, quality of products /services. Intangible benefits in organizational improvements based on infrastructure investments and improved customer relationships. ERP impact on revenue growth and profit margins, reducing inventory by 10%, increasing customer satisfaction by 5%, increasing market share by 1%, and improving productivity.
Paper 15 / (de Araújo Santos, Lima & Filho, 2010) CS	Organizational ignorance of the implementation process leads to delays and operational problems, which in turn causes additional costs; initial investments are extremely high, which emphasizes the importance of the financial component of the project success; the biggest costs of ERP, except implementation are maintenance costs; often neglected.	ERP implementation enables data centralization, improved business control, process standardization, increased business productivity and quality, increased business maturity, better strategic decision making.

Paper 16 / (Gattiker & Goodhue, 2000) CS	The difference in organizational subunits affects the creation of trade-offs and the increase in design costs during ERP implementation; accordingly, the costs of implementing, designing and maintaining the system are expressed; furthermore, costs of data standardization also arise because data and information exchanged within organizations must be standardized.	ERP contributes to (1) improving information flow through departments; standardization and integration facilitate communication and better coordination; (2) centralization of administrative activities affects administrative savings; ERP reduces IT maintenance costs and enables introduction of new capabilities; (3) additional value in terms of adopting best practices for managing business processes (4); ERP also affects the improvement of coordination; discipline and elimination of unnecessary data entries, job automation.
Paper 17 / (Chengmeng, 2012) OSP	Initial ERP investment costs as platform costs (hardware and software); data migration costs; education and training costs. ERP maintenance costs relate to enabling normal operation, updating, and the cost of additional education and training to constantly changing work processes due to the application of new technologies.	Analysing data, exploring value in it, and harnessing information, leads to the overcoming of weak points in corporate governance and, consequently, to increasing profits.

Note! CS – Case Study; N = number of case studies or survey participants; OSP - original scientific paper
(Source: Authors)

Researched cost and benefits (in Table 1) would be the base ground for benefits and its multiplication effects in use of ERP systems in field of Smart Agriculture affected with the Digital Transformation and ever-widening application of Industry 4.0 technologies such as Big Data, Internet of Things, Artificial Intelligence, Drones and others.

7. RESULTS OF LITERATURE REVIEW ON BENEFITS OF ERP IN THE CONTEXT OF DIGITAL TRANSFORMATION AND USE IN SMART AGRICULTURE WITH INDUSTRY 4.0 TECHNOLOGIES

Since second phase of research included Smart Agriculture and use of ERP systems, the potential benefits are explored and presented (see Table 2) combined together according to dominant technology used, general use of ERP or Digital Transformation.

Table 2: Benefits of ERP in the context of Digital Transformation and use in Smart Agriculture

Paper No / Source	Benefits	
Paper 01 / (Asprion, Schneider & Grimberg, 2018) OSP	General	ERP benefits are in people-centricity focus and paper provide path for ERP systems to transform. Transformation is in harmony with Industry 4.0 technologies or disruptive technologies as mention by author, from classic ERP to more user-centred or integrated solutions; providing more agility or more efficiency; depending on product or service centric approach. This leads to benefits in Smart Agriculture in a way of focusing to ERP solution more specialized for services or production.
Paper 02 / (Haberli Junior et al, 2019) OSP N=448	General	Study investigate farmers perception on performance after the ERP implementation. Routinization effect of ERP is researched on 448 farmers using ERP systems and its correlation to impact on costs, internal operations, sales and natural resources. ERP positively impact farm performance, cost reduction, sales and natural resources.
Paper 03 / (Kulikov et al, 2020) CS N=55	General	ERP systems in agriculture benefits by improving business performance, reduce and help monitor costs. ERPs are helpful in decision-making and can serve as the basis for Precision Agriculture. Main problems and barriers for implementation in agriculture are poor personnel skills and competencies, shortage of funds for ERP adoption, poorly developed or absent infrastructure, difficulties of fitting and adapting of ERP systems to agricultural business.

Paper 04, 05, 06, 07, 08, 09 / (Patel, Joshi & Ravikumar, 2020), (Nayak et al, 2020), (Agrawal & Kamboj, 2019), (Pratihar et al, 2019), (Mahalakshmi et al, 2020), (Patil & Jadhav, 2019) CS	IoT	Benefits provided with use of IoT technologies provide sensors for various things like collecting information on fertility of the soil, weather, growth of crops, temperature, rainfall and information regarding plantation of seeds, moisture in the soil, humidity, use of pesticides, monitoring and irrigation system, soil improvement and plant supplementation, which leads to multiplicative benefits in better planning, productivity and production results. Integrated systems, lower cost of wireless networks, RFID, and other sensors, leads to gathering knowledge and services through IoT which maximises the volume of productivity, product quality and profit of business.
Paper 10, 11 / (Verma et al, 2020) , (Coble et al, 2018) CS	Big Data	Enables precision agriculture, farm management and predictions based on large datasets gathered by IoT sensors networks; cameras; network infrastructure and by processing all this data by AI, Machine learning, Regression Analysis and other methods to gather knowledge and support precision agriculture and make it smart... Papers provide lot of useful information on how to use and combine emerging technologies and collect them from various sources.
Paper 12, 13 / (Ahmad, Ahmad and Jamshed, 2015), (Symeonaki et al, 2017) OSP	Cloud Computing	Cloud Computing provide, store and process data in cloud environment. CC make benefits both as platform for Cloud ERP solutions in agriculture, and in same time as gathering point of external hosted CC for IoT services platform to manage full utilization and application of appropriate knowledge and technology by the users across the country. Use of cloud ERP interconnected to smart phones, sensors and other platforms.
Paper 14, 15, 16/ (Balakrishna Reddy & Ratna Kumar, 2020), (Lin et al, 2018), (Lezoche et al, 2020) CS	Blockchain	Blockchain technology and principle is used to food traceability in Smart Agriculture and interconnection of whole supply chain with possible improvements in quality control and general traceability of food origin especially for organic food supply chains.
Paper 17, 18 / (Mazzetto, Gallo & Sacco, 2020), (Zaripova et al, 2019) OSP	Digital Transformation	Papers systematize the use of Digital Transformation of Agriculture in phase from, planning, production and supply chain management and lights up benefits and possibilities that bring appropriate use of existing systems such as ERP and new emerging technologies of Industry 4.0 in synergy and right interconnection.

Note! CS – Case Study; N = number of case studies or survey participants; OSP - original scientific paper.
(Source: Authors)

8. CONCLUSION

Role of ERP systems and its benefits in the field of Smart Agriculture with the interconnection to technologies of Industry 4.0 and Digital Transformation leads to conclusions that these synergetic effects occur in common use but also in use in Smart Agriculture. Perceived common benefits of ERP implementations are seen also in Smart Agriculture and technologies used for its extension, such as IoT, Big Data, AI, Cloud Computing, Blockchain and others. Large scale of various benefits in agricultural business process seam promising especially in ensuring long-term sustainability of the agricultural industry.

Additionally, when ERP is integrated in digital transformation efforts multiplication effect of benefits can be expected in terms of better planning, prediction, monitoring, productivity and production in relation to customer expectations and satisfaction.

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RESEARCH ON THE FINANCIAL LITERACY ON CAPITAL MARKET AMONG STUDENTS

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ABSTRACT

The capital market has developed to an unprecedentedly high level. The participation on the capital market requires a certain level of financial literacy. Financial literacy is defined as a combination of awareness, knowledge, skills, attitudes and behaviors essential for making sensible financial decisions. Financial literacy plays a major role in the business world as well as in the private sphere of individuals. Nevertheless, not enough attention is given to the education of citizens and improvement of their financial literacy. This study examines students in the city of Varaždin at the Faculty of Organization and Informatics (FOI) of the University of Zagreb and their financial literacy, interest in investing in the capital market and starting their own business in the future. The research was conducted among 336 students of all study programs and at all levels of study, and it involved a questionnaire mostly based on the OECD/INFE (2014) Toolkit for measuring financial literacy and inclusion, while some questions were proposed by the authors themselves. The object of this research is to determine the level of financial literacy according to various variables. The research aims to discover how students' financial knowledge impacts their aversion towards risks as well as their inclination towards investing later in life. Finally, the paper aims to establish a link between students' inclination towards risks and investment ambitions for the future. The results obtained by this research show that there is a difference in the level of financial literacy between the economics majors and students majoring in other subjects. Furthermore, the results indicate that senior students score higher and demonstrate a higher level of financial literacy than freshman and sophomore students. Considering that in this study there is a correlation between the level of financial literacy, study programme and degree level, it can be concluded that students obtain their financial education and literacy from their study program curricula, which is confirmed by higher scores achieved by economics majors. Although investing in the capital market is the first step in generating alternative sources of income and achieving financial security, the majority of the respondents still expresses no interest in investing in the capital market.

Keywords: *Faculty of Organization and Informatics, Financial literacy, Investment, Education, Capital market*

1. INTRODUCTION

According to the OECD International Network on Financial Education (OECD/INFE), financial literacy is defined as a combination of awareness, knowledge, skills, attitudes and behavior necessary to make sound financial decisions and ultimately achieve individual financial well-being. It is important to extend knowledge on financial literacy during one's lifetime since each person is faced with at least a dozen financial decisions on a daily basis, ranging from a desire to spend their money on one thing, invest it in another one or keep it in a savings account. The understanding of financial terms and concepts has become the key prerequisite for an efficient and safe money management, which will eventually lead to wealth accumulation in the future my means of investments. Consequently, individuals have to be aware of the risks associated with an insufficient level of financial education and how it could affect their lives (oecd.org, 2014). The concept of financial literacy has still not received enough attention considering the level of importance it has in people's everyday lives. The Ministry of Finance (2019) indicates that every day the banking sector provides new financial services and products which the majority of people continue using all their lives without ever knowing more than just the basic information available to them. If the significance of financial literacy and education on finance and money management remains neglected, individuals could face numerous financial difficulties, which could ultimately lead them to lose their accommodation or even life savings. This is precisely the reason why possessing financial knowledge has become a prerequisite for resolving and averting financial problems, which ultimately results in a secure life in the third age. Seeing that the results of the financial literacy survey are quite sobering, the Croatian Ministry of Finance, the main authority responsible for financial literacy in the Republic of Croatia, developed the National Strategic Framework for Consumer Financial Literacy for the period 2015 – 2020. The Framework is aimed at improving financial literacy through various activities including citizens from all age groups and connecting government bodies, non-government organizations, financial institutions and other legal entities in their joint participation in financial education programs. (Government Conclusion on the acceptance of the National Strategic Framework for Consumer Financial Literacy for the period 2015 – 2020, Official Gazette 11/15). Additionally, in 2005 the OECD Council (2005) published recommendations on financial education and raising financial awareness as a result of bad financial literacy statistics worldwide. The Council indicated that financial literacy programs should be implemented in every citizen's life and become an important part of their life. Furthermore, the Council pointed out that financial literacy should be integrated in regulatory and administrative systems of countries with the aim of providing financial knowledge, information and advice, and protecting consumers as well. The Council argued that banks should be the main initiators of financial education of their clients. Moreover, the Council stressed that bank employees should be the first ones to receive financial education in order to be able to transfer their knowledge onto citizens (oecd.org, 2005). At the beginning of 2016, the Croatian Financial Services Supervisory Agency (HANFA) in cooperation with the Croatian National Bank (HNB) published the results of their joint financial literacy survey conducted in the Republic of Croatia. This is the largest survey that has ever been conducted at the national level, and its principal objective was to gather information on financial literacy and competency level of the citizens of the Republic of Croatia. The results obtained by the survey suggest that citizens under the age of 19 demonstrate the lowest level of financial knowledge and skills, and have the least appropriate attitude towards money (Hanfa.hr, 2016). These are the individuals who have enrolled in tertiary education (university) and three-year vocational school graduates who already participate in the labor market while still not possessing the level of financial knowledge sufficient for a responsible management of they own financial assets.

Considering the given results, it can be concluded that there is a need for conducting further research among young people with the ultimate goal of providing youth with financial education and literacy programs.

2. LITERATURE REVIEW

Recently, extensive research has been conducted on financial literacy of not only students, but entire populations of particular countries as well. The results of this research suggest that financial education of citizens is necessary at the global level, but the research undertaken in the Republic of Croatia shows that it is especially youth that should be the main target of this type of education. In Croatia, the principal problem is the fact that not much attention is given to financial literacy, which should be taught from an early age. Instead, citizens acquire most of their financial knowledge from the media or by individual engagement. As far as students are concerned, the concepts of financial literacy and the importance of appropriate financial behavior and attitude towards money can be identified only among students of economics-oriented universities. These results do not come as a surprise since there already is a large amount of research supporting precisely this statement, including Chen & Volpe (1998), Mišević, Pavković i Šoštarić (2016) and (Sarigül, 2014). A significant number of studies dealing with financial literacy and financial knowledge of students suggest that there is a direct correlation between various factors and students' financial literacy. Sarigül (2014) undertook a study on financial literacy among more than 1.127 students from three universities. The goal of the study was to determine whether there is a relationship between financial literacy and certain student characteristics. Sarigül (2014) used a questionnaire of 29 items pertaining to general financial knowledge on saving and spending, banking, risks and insurance, and investing. The results of the study indicate that social sciences students demonstrate a higher level of financial knowledge than students majoring in other subjects. A direct link was identified between students' level of financial literacy and knowledge and being a business or economics major. Furthermore, the results show that senior students scored higher than all the other students, especially freshman students. Oseifuah, Gyekye and Formadi (2018) conducted a study on the level of financial literacy of college students in northern Ghana. The main goal of the study was to examine whether gender, age, study program, study year, parents' incomes and students' financial status affect students' level of financial literacy. The study was based on the OECD/INFE questionnaire for measuring financial literacy and it included 384 college students at the University for Development Studies (UDS) in Ghana. The results of the study indicate that more than 81% of students use financial products, while only 53.5% of the respondents are financially literate. Moreover, it was noted that students set their own budgets, they do not exceed the planned monthly budget, and have placed funds into a savings account at a bank. The majority of students stated having acquired their financial literacy, knowledge and understanding of financial products and services from their parents, previous experience involving financial management, and finally educational institutions. The final results suggest that 45.5% of students are financially illiterate. Danes and Tahira (1987) conducted a study on money management knowledge of college students. The study included 716 students, 323 of whom were asked to answer 51 questions in order to establish a correlation between students' knowledge and money management skills. Danes and Tahira used a questionnaire of 51 items pertaining to areas of knowledge such as credit cards, insurance, personal loans, spending, and overall financial management. The study found that senior students demonstrate a higher level of knowledge of credit cards than freshman students, supporting the statement that students' age correlates with higher levels of financial knowledge. Furthermore, the results suggest that the students in employment are more knowledgeable on credit cards than the unemployed students, that the students not living in a dormitory are more knowledgeable about credit cards and personal loans than the students living on campus, and that male students have higher levels

of insurance and personal loan knowledge than female students. Overall, the study results show that only 28% of the respondents are familiar with life insurance, while only 27% of the surveyed students could calculate the annual interest rate. Shahrabani (2013) conducted a study on the level of financial literacy of college students in Israel. The main goals of the study were to get an insight into financial literacy levels of Israeli college students, examine gaps in financial literacy between Jews and Arabs, and determine the factors affecting students' financial literacy. The study was conducted by means of a questionnaire consisting of multiple-choice questions. The study's sample comprised 574 students from two universities in Israel. The questions that were given to students tested their knowledge in areas such as savings, simple financial transactions, financial planning, investing, inflation and risk diversification. The hypothesis that more than 60% of Israeli students is financially literate was not confirmed. However, the students considering themselves financially literate are senior students who pursue economics and business degrees, which therefore confirms that there is a correlation between students' financial literacy, study program and age. Additionally, the study found that male students have a higher level of financial literacy. When nationality is taken into account, the majority of correct answers was provided by Jews, who exhibit higher levels of financial literacy. Bestari and Nidar (2012) conducted a study on financial literacy of college students in Indonesia with the aim of determining the level of financial literacy of students in Indonesia and making a comparison with students from other countries. The study surveyed 400 college students of Padjadjaran University and collected data by means of a questionnaire. The questions students had to answer related to areas such as personal finances, income and spending, credit and debt, savings and investing, and insurance. Bestari i Nidar (2012) formulated 24 hypotheses based on 24 variables which included socioeconomic characteristics as well as financial and business parameters. The results suggest that the majority of students could only answer questions relating to incomes and spending (63.21%), while only a minority could provide correct answers to questions pertaining to credits and debs (31.97%) and savings and investing (34.19%). The consolidated results suggest that only 42% of students is financially literate. According to Bestari and Nidar, the bad results are a consequence of the respondents' age (18-22) and their lack of work experience. Rodrigues, Vieira, Amaral and Martins (2012) undertook a study on financial literacy of college students in Portugal. The objective of their study was to demonstrate the level of financial literacy and financial behaviors of college students in Portugal. The study was conducted by means of a survey questionnaire and it involved a sample of 612 students from seven universities in Portugal. The students had to answer questions testing their knowledge in areas such as interest rates, inflation, credit cards, annual effective interest rate and financial behaviors. The results obtained by the study show that the respondents provided most of the correct answers to questions relating to the annual effective interest rate (86.93%), while the smallest portion of correct answers was in the credit cards section of the questionnaire (29.41) Furthermore, the majority of students stated their own parents as their main incentive to deposit money. Finally, the results of the survey show that students correctly answered, on average, 5.48 out of 8 questions relating to financial literacy, which can be considered encouraging. Mišević, Pavković and Šoštarić (2016) conducted a study on the level of financial literacy of students from the University of Zagreb. The objective of the study was to estimate the level of financial literacy of students from the University of Zagreb and determine whether particular student characteristics influence their level of financial literacy. The study was conducted in two steps – by using qualitative and quantitative research methodology. Quantitative research was carried out by means of a survey questionnaire distributed to 1.600 students of the University of Zagreb. The respondents had to answer the questions from the questionnaire which was based on the OECD's methodology. The study found that there is a difference in financial literacy levels between the students taking an economics course and the students not taking it.

Moreover, it was noted that students' work experience positively affects their level of financial literacy. Nevertheless, the findings indicate that there is no correlation between the level of financial literacy and the gender of students from the University of Zagreb.

3. RESEARCH METHODOLOGY

For the purposes of this paper, empirical research was conducted at the Faculty of Organization and Informatics in Varaždin, which included Bachelor's and Master's students of Informatics and Economics of Entrepreneurship and undergraduate students of the professional study program Information Technology Business Application (PITUP). The main purpose of this study is to examine, analyze and demonstrate students' level of readiness to invest in the capital market, their level of financial literacy, as well as to explore whether there is a link between the students exhibiting low levels of risk aversion and investment ambitions and the desire of the students at the Faculty of Organization and Informatics in Varaždin to found a company of their own after finishing their studies. The sample used in this study was deliberately chosen, i.e. convenience sampling method, a sampling technique that involves choosing a research sample based on convenience, was used (Šošić and Serdar 1995; Mejovšek, 2013). The study surveyed a sample size of 336 students at the Faculty of Organization and Informatics in Varaždin out of the total of 2.725 students of undergraduate and postgraduate studies. There were 190 female and 146 male students among the respondents. Of the 336 surveyed students, there were 244 undergraduate level students, while 92 students were postgraduates. Moreover, of the 244 undergraduate students, 80 students are informatics majors (23.81%), 87 students major in Economics of Entrepreneurship (25.89%), and 77 students are PITUP majors (22.92%). The rest of the surveyed students are at the postgraduate study level, i.e. 10.42% of the surveyed students are Informatics majors, while 16.96% of the students are major in Economics of Entrepreneurship. The instrument used in this empirical research was an online survey questionnaire whose aim was to investigate students' level of financial literacy and their readiness to invest in the capital market. The survey was conducted in the period between 8 April and 15 August 2019 and it was administered to students at the Faculty of Organization and Informatics in Varaždin via the online learning platform Moodle, closed Facebook groups created by the students of the Faculty, the official website of the Student Support and Career Development Centre (CPSRK), the student association Business club@FOI and the Faculty's student newspaper STAK. The survey questionnaire was created following the 2015 OECD/INFE Toolkit for measuring financial literacy and financial inclusion. Most of the questions are based on the 2015 Toolkit, while some were modified in order to adjust the questionnaire for students and obtain as precise and significant results as possible for the purposes of this study. Additionally, two questions were taken from the research methodology of the Standard&Poor's Global Financial Literacy Survey (gflec.org, 2014), and one from the OECD/INFE survey (oecd.org, 2016). The questionnaire itself is composed of three parts: General information about the respondent, Financial literacy, and finally Readiness to invest in the capital market.

4. RESEARCH RESULTS

Before distributing the final version of the questionnaire, a pilot survey was conducted on a smaller sample in order to test the quality and reliability of the research instrument. After the test, the survey questionnaire was sent to 2.725 students at graduate and undergraduate study levels. The questionnaire was completed by 336 students, i.e. 12.33% of all students at the Faculty. A detailed overview of the sample with participants data is presented in Table 1.

Table following on the next page

Number of surveyed students	1st year		2nd year		3rd year		Total
	M	F	M	F	M	F	/
B.A. in Informatics	34	16	9	5	14	2	80
B.A. in Economics of Entrepreneurship	3	20	5	22	8	29	87
PITUP	8	9	21	19	10	10	77
M.sc. in Informatics	12	6	11	6	/	/	35
M.sc. in Economics of Entrepreneurship	4	34	7	12	/	/	57
Total	/	/	/	/	/	/	336

Table 1: The number of students participating in the survey (Source: created by the authors of the paper)

The largest number of the respondents come from a rural area with no more than 5.000 inhabitants (39.6%) and urban areas with no more than 50.000 inhabitants (34.8%). More than 42% stated being unemployed, 37.2% reported working intermittently, while 20.8% of students reported working and studying at the same time. More than a half of the surveyed students (56.8%) live with their parents or family members, while more than 36% live with a roommate in a student dormitory or in a private residence. The first research question aims to test the level of financial literacy according to gender and has revealed that male respondents have a higher level of financial literacy than female respondents. According to the results, male respondents correctly answered, on average, 51.25% of the given questions. On the other hand, female respondents correctly answered 48.13% of the questions. The test has led to the conclusion that, on average, male respondents correctly answered more questions than female respondents. Nonetheless, the findings of the survey suggest that male and female respondents have the same level of financial literacy, i.e. they do not demonstrate a sufficient level of financial knowledge of deposit insurance in banks in the Republic of Croatia, and have poor understanding of the difference between open-end and closed-end investment funds. The survey has revealed that there is a disparity in the level of financial literacy of economics majors and non-economics majors, thus supporting numerous previous research findings (Shahrabani, 2013; Sarigül 2014; Mišević et al., 2016; Chen & Volpe, 1998). On average, economics majors correctly answered 54% of the questions, whilst informatics and PITUP majors provided a correct answer to 46% of the given questions. This reiterates the fact that there is a gap in financial knowledge between economics majors and others. Such findings are an inevitable consequence of economics majors having taken an economics course during their studies, which is an important source of students' financial education and literacy. Although economics majors have a higher level of financial literacy, the results obtained by the survey show that not even they could answer the questions on deposit insurance in banks in the Republic of Croatia, nor could they state the most expensive form of financing available to citizens. According to the variables of gender and study year, the results confirm the hypothesis. Notwithstanding the study program, it is noted that postgraduate students have a higher level of financial literacy than their undergraduate counterparts. On the other hand, even if postgraduate students majoring in informatics correctly answered more questions and have a higher level of financial literacy than their undergraduate colleagues, their level of financial knowledge is still lower than that of undergraduate economics students, all of which once again reaffirms the importance of taking a course in economics while acquiring financial knowledge. Taking into account permanent and temporary residence, and work experience as determinants of high financial literacy, the survey results suggest that these characteristics do not affect students' financial literacy. This leads to the conclusion that the most important factor affecting financial literacy is the study program, i.e.

the number of courses students have taken in economics and their year of study. It is noted that students' financial literacy level is proportional to the level of study (Danes M. and Tahira K., 1987). Such findings support the conclusions of the 2016 study (Hanfa.hr, 2016) stating that people under the age of 19 are the least financially educated cohort in the Republic of Croatia. It should be emphasized that significant answers to certain questions have been obtained on the basis of the survey results. Although male respondents have a higher level of financial literacy than female respondents, and respondents majoring in economics of entrepreneurship demonstrate a higher degree of financial knowledge than respondents majoring in informatics and PITUP, the largest number of respondents could not provide answers to the questions on the insurance of client deposits in banks in Croatia and the difference between open-end and closed-end investment funds, which indicates that there is a need for further financial education in these particular fields. As far as the knowledge of concepts pertaining to interests and interest rates, the majority of wrong answers were provided by economics majors, which is in contrast with much of the previous research on this topic. In 2015, a survey on the understanding of concepts related to interest rates and the way it functions was undertaken by Standard & Poor's Ratings Services (Gflec.org, 2015). The survey questions tested the knowledge of interest rates and the amount of interest that can be yielded while saving money in an interest-earning account over a certain period of time. More than 140 countries participated in the survey and the average correct answer rate worldwide was 45%. In developed countries (US, Japan, France, Canada, UK, Germany), the rate was around 55% (US 70%; Japan 37%), while in developing economies (Brazil, China, India, South Africa, Turkey) the rate was 40% (Brazil 20%; Turkey 15%). According to the findings of the survey comprising 336 students at the Faculty of Organization and Informatics, 58.19% of the respondents answered correctly. A more detailed stratification of the sample has revealed that male respondents score higher than females in this field, which is in accordance with the findings of the research conducted by Shahrabani in 2013. Moreover, according to the study program, students majoring in economics and in related branches are the most knowledgeable, which complies with previous research findings (Shahrabani, 2013; Sarigül 2014; Mišević et al., 2016; Chen & Volpe, 1998). Therefore, it can be concluded that FOI students have more knowledge in the field of interest rates in comparison with the average level of knowledge worldwide. Moreover, the 58.19% correct answer rate suggests that FOI students' level of knowledge is not only higher than the average level, but also higher than the average level of knowledge in developing countries, which is 55%. These findings can be linked to the development of the national economy and the country itself, as well as Croatia's alienation from Eastern and North Eastern Europe and closer ties with Western European countries, which was partly aided by its entry in the EU.

5. CONCLUSION

This study involving 336 students from the Faculty of Organization and Informatics was conducted with the goal of testing students' level of financial literacy and readiness to invest in the capital market. The survey results are in accordance with the findings of previous studies indicating that there is a relationship between financial literacy and demographic characteristics of students such as age, gender, study program and taking a course in economics as part of academic education (Shahrabani, 2013; Sarigül 2014; Mišević et al., 2016; Chen & Volpe, 1998). The findings of the survey lead to the conclusions that male respondents are more financially knowledgeable than their female colleagues, economics majors have a higher level of financial literacy than informatics and PITUP majors, postgraduate economics students have more knowledge of finance than their undergraduate counterparts, who are in turn more knowledgeable than undergraduate informatics and PITUP majors. However, the study questions helped to verify that there is no difference in financial literacy level between students living with their parents and independently, students living in urban and rural areas, and

students who have some past work experience and those who are not in employment and have no work experience. The survey has revealed that students majoring in economics of entrepreneurship have the highest level of knowledge about inflation, financial concepts and risk diversification, while also being the least knowledgeable in matters related to interest rates. Furthermore, the study has shown that undergraduate informatics students have the lowest level of financial literacy. The majority of them incorrectly answered the questions on the inflation rate in Croatia, the most expensive form of financing available to citizens, and general financial concepts. This is due to the fact that undergraduate informatics students are not taking as many courses related to economics, finance and capital markets since they are not part of the curriculum, which is quite evident from the results. Additionally, the survey has shown that PITUP majors are more knowledgeable than informatics majors because they have been obliged to take more courses in economics and finance, which confirms that there is a correlation between students' financial literacy and having taken an economics course during one's studies (Chen & Volpe, 1998; Mišević et al., 2016; Sarigül, 2014). In addition, only 14.6% of students provided correct answers to the questions on the difference between open-end and closed-end funds – a fact testifying of all students' insufficient level of financial literacy, regardless of their major, in the field this question pertains to. Furthermore, this study aims to examine whether there is a relationship between students' risk levels and readiness to invest in the capital market, i.e. start up their own business. The findings show that most of the students are still not sure whether they will invest in the capital market, stating the fear of losing their money, insufficient understanding of the capital market and insufficient development of the capital market as the main reasons. Moreover, the majority of the students is still not sure whether they will start up their own business in the future, stating endless bureaucratic red-tape, the stress experienced in the process of founding a company, and a bad entrepreneurial climate in their country as the main obstacles to their entrepreneurial ambitions. On the other hand, the results show that there is a relationship between the level of risk and participation in the capital market. The largest number of students exhibit a medium degree of risk aversion, and do not plan or are not certain whether they will invest in the capital market. However, students expressing low levels of risk aversion, or those not expressing it at all, report that they intend to invest in the capital market. The findings of this study indicate that there is a need for further financial education of students. It is expected that this study will prompt students to invest more time into their financial education and motivate them to start thinking about investing in the capital market since they will soon become part of this market themselves. As the survey results suggest, it is necessary to implement economics courses and courses dealing with financial literacy and education in non-economics study programs.

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THE BANK INSOLVENCY: FROM LEHMAN BROTHERS TO COVID-19 (INTERNATIONAL REMARKS AND NATIONAL PECULIARITIES)

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ABSTRACT

A study of the international experience of applicable policies for crisis management in the credit system in bank insolvency, identifies three types of solutions, including: elimination of the "toxic element" in the banking system following the example of "Lehman Brothers" in the US from 15.09. 2008 through a voluntary insolvency procedure declared by the bank's management before the respective regulatory body; support for the financially troubled institution through nationalization and a reform plan following the example of Northern Rock in the UK from 2007-2008 and Greek banks from the Greek debt crisis after 2010; liquidation of the "toxic element" in the banking system, following the example of CCB in Bulgaria (2014-2020), through a regulatory insolvency procedure. Each of the three policies has its pros and cons, but it definitely has a "stressful" impact on banking systems and economic agents with long-term

consequences, incl. in the context of the TBTF doctrine. On this basis, international regulators are introducing the methodology of bank stress tests for early warning of bank insolvency. The study of the experience of the central banks, BIS and ECB for conducting stress tests brings to the fore their grouping by three criteria: first criteria - Type of stress test, which distinguishes stress tests conducted by macroprudential authorities for the purpose of assessing broad systemic risks, stress tests conducted by microprudential authorities for supervisory purposes and stress tests by the internal bank risk management for the purposes of assessing capital adequacy policies; second criteria - Focus of the stress test, which distinguishes systematic assessments at the institutional level, measuring mainly solvency or liquidity, assessments on the first and second pillars of Basel II, as well as assessments of financial instruments, investment portfolios, business sectors from institutional positions to prepare models for decision-making by the central banking management regarding the response to the various risks; and third criteria - Approach to conducting the stress test, which is grouped into two categories, top - down and vice versa, bottom - up. These approaches must be tested with the new environment for COVID-19 as a global systemic risk generator. Its impact on the creditworthiness of companies, households and the state can be assessed as extremely negative and testing the capital adequacy of commercial banks under BASEL III framework.
Keywords: *Bank Insolvency, Lehman Brothers, TBTF, Bank Stress test, COVID-19*

1. INTRODUCTION

The structure of the banking system and its main regulatory functions give the Central Bank the right to arrange in hierarchy, subordinate and notify the units of the banking system in a way that provides for the stability of the system itself. The very structure of central bank governance gives broad powers to banking supervision thus transforming the supervisory responsibility described on paper into a stable information flow of reports, instructions, regulations, measures and actions for the needs of the decision-making on maintaining the stability of the banking system. However, in all circumstances, the banking system at its fundamental level - credit institutions - may be subject to circumstances of unfavourable external, macroeconomic, or adverse, internal management nature, as well as to a combination of these. In such a situation or in case of a combination of adverse influences, the stability of the banking system may turn out to be under pressure. Respectively, the units that have taken exorbitant risks can be measured as carriers or holders of such a volume of "toxic assets" that, due to the effect of interconnection through loans and deposits of credit institutions, "infects" the entire system in a cascade manner. Such "toxification" calls for the implementation of a set of measures, which are normally regulated in an Insolvency Act. These measures lead to temporary or permanent delicensing of the "toxic" credit institution, incl. and until the appointment of new management, through conservators to administrators. This stage of the life cycle of the banking institution gives rise to two alternatives: recovery through measures and a support program or winding up of the respective credit institution. However, commercial banks are not legal entities with limited influence and role in the economic life and monetary turnover in an economy. They are also international operators in payment systems. There are tens of thousands of depositors in the liabilities of their balance sheets, resp. depositors who, against the confidence of security and return, perform the savings function of money. The status of a depositor is acquired when depositing funds on a deposit in a commercial bank. The assets of the balance sheet include loan applicants and borrowers, who in turn use the resources in the liabilities in the form of loans for various purposes. These are practically two types of clients, each with its own interests and legal protection. However, the key difference between the two types of clients is that the interests of depositors within the European Union are legally protected by the Bank Deposit Protection Act, as well as by the national institution Deposit Insurance Fund.

There exist two bank insolvency situations:

- The first is related to the comparison between what the bank owns (its assets) and what it owes (its liabilities). In case of negative coverage of liabilities with assets, the bank is considered to be insolvent. The insolvency is established on an accounting basis by comparison of the documents that evidence the value of the assets and the liabilities of the bank. When the insolvency is confirmed by a decision of the competent court, a procedure regulated in the Law on Bankruptcy is opened.
- In the second situation, when comparing the assets and the liabilities of the bank the value is positive, but if the bank is unable to service its current payments, cash flow insolvency or lack of bank liquidity is established. Thus, the bank may be endangered by a cascading increase in the claims of depositors for withdrawal of a resource, at the expense of operations with a respective time lag in the asset. This usually results in a request from the bank management for liquidity support from the Central Bank, which can be approved but can also be refused. If liquidity support is not approved, the CB may proceed to treat the bank as a "toxic" component in the banking system, which must be temporarily delicensed until authorized persons (conservators) assess its actual condition: assets, liabilities, property and capital.

2. BANK CRISES AND BANK INSOLVENCY

2.1. Theoretic evidence

The studies of (Hannan, Henweck, 1988; Hainz, 2005; Lastra, 2008; Strobel, 2011c; Campbell, 2006) systematise modern views on crisis management in the credit system in the event of bank insolvency. These studies outline a wide range of internationally applicable policies for credit crisis management in the event of bank insolvency, including:

- Liquidation of the "toxic element" in the banking system following the example of "Lehman Brothers" in the USA from 15.09.2008 through a voluntary insolvency procedure, declared by the bank's management before the relevant regulatory authority. Such liquidation definitely has a “cascading” effect on many other financial institutions under the rule that “it was primarily large banks, savings and loans and brokerage firms who were impacted the most.” (Johnson, Mamun, 2012a);
- Support for the troubled financial institution, through nationalization and a reform plan following the example of Northern Rock in the UK from 2007-2008 (Lastra, 2008a) and the Greek banks from the Greek debt crisis after 2010 (Vogiazas, Alexiou, 2013).
- Liquidation of the “toxic element” in the banking system following the example of Bulgaria with Corporate Commercial Bank in 2014 through a insolvency procedure under regulation.

There is evidence of research related to this doctrine long before the latest negative findings in the 21st century, cf. (Pettway, 1980; Hannan, Henweck, 1988). A more recent study from 2017 (Kazandzhieva-Yordanova, 2017) confirms that the TBTF doctrine has negative consequences and this requires "measures to limit government intervention in cases of insolvency of systemically important banks", as "… in the EU such measures were taken mostly in the supervision of systemically important banks, the capital requirements, the capacity of banks to absorb losses by using domestic resources, and deposit guarantee schemes.” The author examines the evolution of deposit guarantee schemes and makes a parallel analysis of its impact on the TBTF doctrine thus proving that the development of deposit insurance has a contradictory impact on the TBTF doctrine.

Figure following on the next page

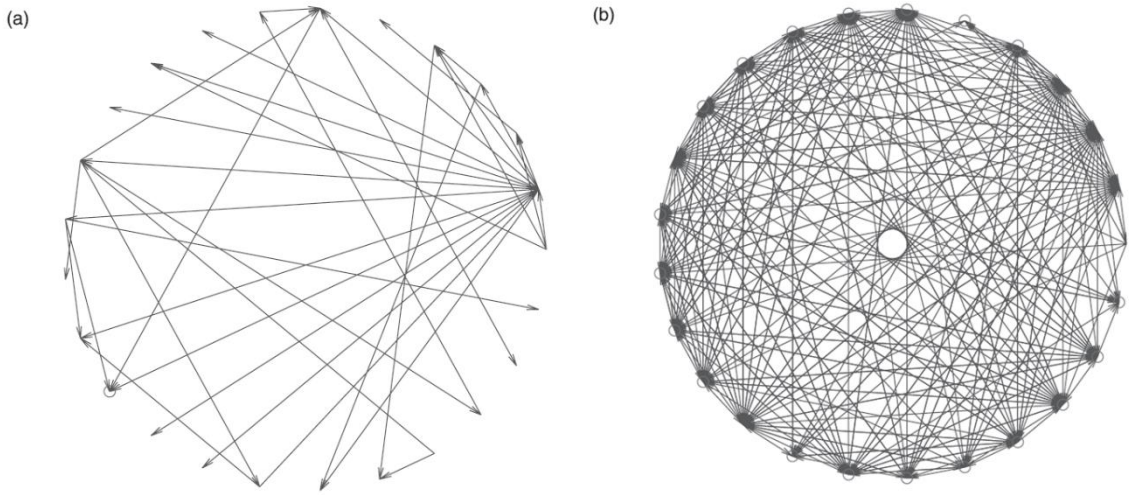

Figure 1: Modeling of interbank operations in the context of the possibility of bank default cascades
Source: (Canedo, Jaramillo, 2009)

A more recent study from 2011 however also examines the relationship between the structure of the loan portfolio and the risk of insolvency, cf. (Rahman, 2011a; Tsai, 2010a). A study of economies in transition, cf. (Hainz, 2005), confirms the direct link between bank insolvency and companies' decisions for new investments secured by credit resources. (Campbell, 2006) in turn examines the effect of the relationship between bank insolvency and the behaviour of depositors, arguing in the direction of priority of recovery (the second policy systematized above) instead of direct insolvency proceedings. The application of these three scenarios goes through the classic supervisory review mechanism, which provides the link between the risk profile of the institution and the internal risk and equity management systems (Zahariev, 2014d). Each of the scenarios follows the logic of the concept of process management oriented towards achieving desired results (Terziev, 2020a, Terziev, 2019b-d; Terziev et al. 2020b; Terziev, Georgiev, Solovev, 2020c-d; Terziev, Lyubcheva, Solovev, 2020e). Nevertheless it concerns a bank or a country, the problem of inability to service debts is more than significant as a scientific and practical issue (Zahariev, et al. 2020f) and it can directly affect the stability of the system of public finances, whether it is a G7 country or a smaller economy (Nikonova et al. 2020). Bank insolvency has not only a national but also a cross-border dimension. For (Lastra, 2008) this dimension includes: the need to create international regulations; establishing common rules of action; international cooperation in the exchange of information and reporting data. However, the same author notes that the Basel Committee has developed a relatively small amount of regulatory measures to address problems caused by cross-border banking crises! His regional study on Latin America confirms the direct link between the international insolvency effect of a national banking institution on an international scale, in view of the non-uniform insolvency legal regimes (Lastra, 2004). In (Kaufman, 2004; Kaufman, 2006a). examines the direct relationship between deposit insurance and regulatory standards for bank insolvency, drawing conclusions about national trends to reduce deposit insurance at the expense of the formation of centralized national deposit guarantee funds (as is the current model in Bulgaria). Another paper (Ngalawa, Tchana, Viegi, 2016a) examines the moral aspect of the relationship between deposit insurance and bank insolvency. Marini (Marini, 2003) further develops the problem of the relationship between bank insolvency and deposit insurance, including capital adequacy. For their part, (Pollner, 2013a) examines the relationship between risk sharing and risk bearing in the light of the new post-crisis banking regulations. (Elsinger, Summer, 2010a) launched the idea of avoiding bank insolvency through recapitalization and restructuring. A 2010 study also focused on the problem of acquiring 'toxic assets' as a result of bank insolvency

proceedings (Wilson, 2010a). The special case of a bank holding company, where the parent company is trying to support its financially troubled subsidiary, is considered in a study by (Branch, Higgason, 2010). The subject of empirical analysis is the Bank of New England Corporation (BNEC), which is owned by a Boston-based holding company. As a result of the analysis, the authors establish the typical discrepancy in the interests of the banking regulator and the holding owner of the bank that experiences solvency problems. Moreover, the bank's claims for resource provision by the holding experience the problems with the fair valuation of exchangeable equivalents, both in terms of positions in BNEC's assets and liabilities. The problem of fair valuation of balance sheet items is also addressed in the study of (Swamy, 2009a) where arguments are given in support of ethical standards for financial analysis. An empirical study of the banking sector in India in the same direction proposes a methodology for assessing bank intellectual capital, which capital usually remains outside the scope of any assessment of bank solvency (Ghosh, Maji, 2014b). A study on the illiquidity components of credit risk advocates the theoretical differentiation between total credit risk, insolvency risk and illiquidity risk (Morris, Shin, 2016). The authors define illiquidity risk as the probability of a default due to a rapid sale of assets when the institution would otherwise have been solvent. They conclude that "the illiquidity risk (i) decreasing in the "liquidity ratio" - the ratio of realizable cash on the balance sheet to short term liabilities; (ii) decreasing in excess return to debt; and (iii) increasing in the solvency uncertainty - a measure of ex post variance of the asset portfolio ". The examined liquidity coverage ratio (LCR) is the basis of the Basel III regulatory standard in the part on the rules for bank capital and liquidity. The derived interpretation of the LCR indicator is the ratio of the stock of high-quality liquid assets to total net cash outflows, where the weights range from 3% for retail deposits to 100% for corporate financing (Basel Committee on Banking Supervision, 2013a). The problem of interbank liquidity support is discussed from the position of reaching an agreement between banking institutions to ensure an appropriate " the ex post transfer of reserves from liquid banks to illiquid banks, so it is possible to select a socially efficient reserve ratio in the banking system that preserves the safety of bank liabilities as a store of value and maximizes the rate of return paid to bank liability holders" (Sanches, 2016b). Such interbank support naturally requires taking into account the interest rate spread, where the "price" of the resource is essential for obtaining interbank refinancing. The data for the Bulgarian banking system show significant levels of the interest rate spread, which exceeded the EU average between 17% and 161% in the period 2008-2014 (Peshev, 2015c). An innovative study on the banking market in India to analyze and assess the insolvency risk in public and private sector credit institutions (Keshari, 2015a) applied sampling classification using CAMEL parameters (i.e. capital adequacy, asset quality, management quality, earnings and liquidity) establishing (Mäkinen, Solanko, 2017a), that in terms of this valuation methodology, regardless of the sector, banks fall within the full range of the valuation scale, which is function of the specifics of the banking business and the quality of the balance sheet items. A study on the contribution of European banks to the instability of the banking sector in credit institutions from Bulgaria, Latvia, Lithuania, Poland, Romania, Turkey, Ukraine and Hungary was conducted using the CoVar method for measuring the systemic risk (Karkowska, 2014c). As a result, specific assessments of the systemic risk are given as a contribution of a bank i in the analyzed banking sector of a country in its insolvency. The sample includes a total of 40 banks traded on the public market, which provides a fair stock market assessment of market capitalization of each of the examined credit institutions. By using the Systems' Generalized Method of Moments estimator (System-GMM) to determine the impact of revenue diversification on performance and banking risk, reliable evidence is provided of the benefits of diversification for banks in emerging economies (Sanya, Wolfe, 2011b). Using the arguments for option pricing, it is proven that even solvent banks will be willing to sell toxic assets at market prices, because the bank's shareholders usually prefer to avoid insolvency, and

respectively being responsible for refinancing. The conclusion that "insolvency puts are more valuable when the banks' assets are more volatile" infers that shareholders in banks will require any buyer to pay for the lost volatility as well as the market price of the toxic assets, which when activated public guarantee schemes means that “taxpayers must be willing to richly overpay if they want banks to voluntarily part with their toxic assets” (Wilson, 2010a). Therefore, risk provisioning is a logical response of the regulator to counteract the risk of bank insolvency (Carmen-Mihaela, Camelia-Daniela, Ovidiu-Octavian, 2009a). A study of the bank's growth limits shows that banks grow either by expanding their market presence within the region within they are domiciled or by expanding their presence in other regions via new implantations. Logically, growth leads to improved diversification, but definitely increases the risk of bank failure. The conclusion is that there is a threshold size of the bank at which the growth rate of its systemic risk exceeds the rate of decline in its risk of insolvency (McFadden, 2008b).

2.2. Capital requirements and benchmark evidences of credit policy

By introducing an “internal and external rating” of loan applicants and borrowers, international accords Basel II and Basel III upgraded CB credit policy. Both standards should be considered as integral parts of a single concept for bank development. It is built on the paradigm of the increasing complexity of banking, in which the stability of individual CBs cannot and should not be guaranteed by the traditional forms of banking supervision. The solution to this problem is through the introduction of a control system through internal bank risk management. At the same time, the mutual monitoring of banks and the single supervisory analysis strengthen market discipline and curb the opportunities for abnormal development of certain CBs at the expense of other by taking risks that are unacceptable for the system and the regulator. From an evolutionary point of view, Basel III builds on Basel II, specifying the capital adequacy requirements in terms of risk-weighted bank assets. The capital requirement imposes a standard on banks that directly conflicts with their dividend policy. The logic of the regulator is that the expansion in the banking business requires the bank management to have set aside enough capital to cover unexpected losses. This in turn keeps the credit institution solvent in a crisis. The main principle is that the amount of required capital directly depends on the risk attached to the assets of a particular bank. The regulator introduces the concept of "own funds requirements" and measures it as a percentage of risk-weighted assets. The logic of the concept of risk-weighted assets is directly proportional: for less risky assets a smaller amount of capital is set aside, and for riskier assets the requirement is for reciprocally larger scale of capital. Thus, the riskier an asset is, the more shareholders have to increase their excess capital, measured by the capital position and its components. The regulator assigns certain grades of capital depending on its quality and the associated risk. Thus, Tier 1 capital is defined as the capital that enables a credit institution to continue its activity while maintaining its solvency without any problems. In terms of banking policy, the common equity Tier 1 capital is defined as the highest quality capital. In turn, Tier 2 capital is associated with the balance sheet item for supplementary capital. The regulatory requirement is that the supplementary capital must enable a particular CB to repay the amounts due to depositors and privileged creditors in the event of insolvency. On this basis, for every 100 units of risk-weighted assets, the bank should have a minimum of 8 units of total capital. For its part, the share of common equity Tier 1 capital should be 4.5% of risk-weighted assets. The BNB and the ECB stipulate that at any given time a CB must meet the following capital requirements: - common equity Tier 1 ratio of 4.5%; - Tier 1 capital ratio 6%; - total capital adequacy ratio 8%.

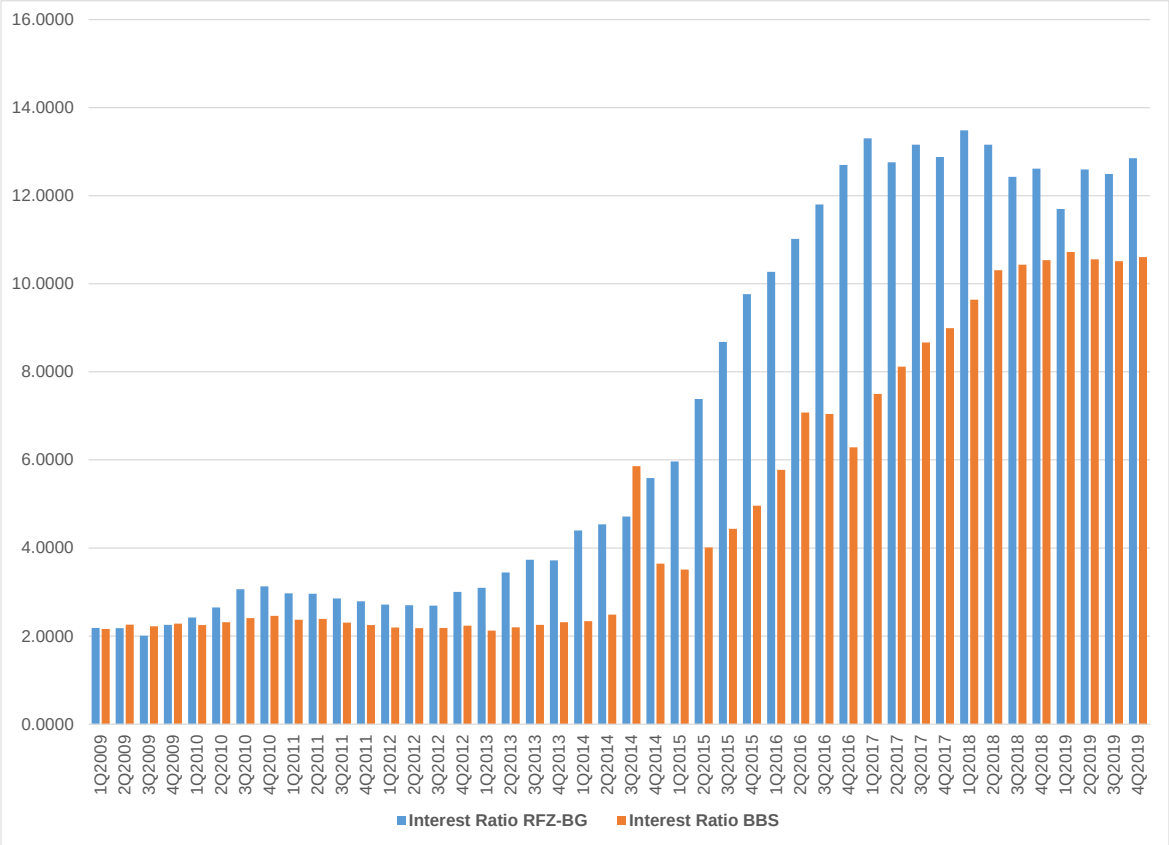

Figure 2: Interest revenues to interest expenses ratio on a quarterly basis of the banking system of Bulgaria and Raiffeisenbank (Bulgaria) EAD (IQ2009-IVQ2019)

As 100% owned by Raiffeisen Bank International, which manages the subsidiaries in Central and Eastern Europe, a single regulatory framework applies to all CIs in the group. Raiffeisen Bank International, for its part, is owned by the Vienna-based Raiffeisen Centralbank, which owns 60.7 percent of the company. The remaining 39.3% are traded on the Vienna Stock Exchange and give an objective assessment of the market capitalization of the banking group on the basis of its consolidated financial statements. It is through the mechanism of the single regulatory framework that Raiffeisenbank (Bulgaria) EAD applies the banking and credit policy of Raiffeisen Centralbank and can be considered a benchmark for the banking system in the country in view of the first-class reputation of the parent company. Historically, Raiffeisenbank (Bulgaria) EAD is the first foreign direct investment in the banking sector in Bulgaria. It was a Greenfield investment made in 1994 and is 100% owned by Raiffeisen Bank International. In its public profile Raiffeisenbank (Bulgaria) EAD is defined as "a universal commercial bank, providing services to large corporate customers, small and medium-sized enterprises, retail clients, trading on the local and the international money and capital markets, asset management, etc." This profile of the bank is up to date and has not been changed since the beginning of 2001, as until then Raiffeisenbank (Bulgaria) EAD mostly rendered services to corporate clients. To assess the quality of the banking policy of Raiffeisenbank (Bulgaria) EAD, the object of analysis are the trends in the interest rate (the excess of interest revenues over interest expenses) of the CB and its correlation with the indicator for the banking system. The data for Raiffeisenbank (Bulgaria) EAD and the banking system show a high degree of correlation with correlation coefficient levels of + 94% and a determination coefficient of 0.88 with 44 observations for the 11-year period 2009-2019. The relationship between the interest rate ratio of the bank and that for the banking system is statistically significant according to Fisher's F criterion.

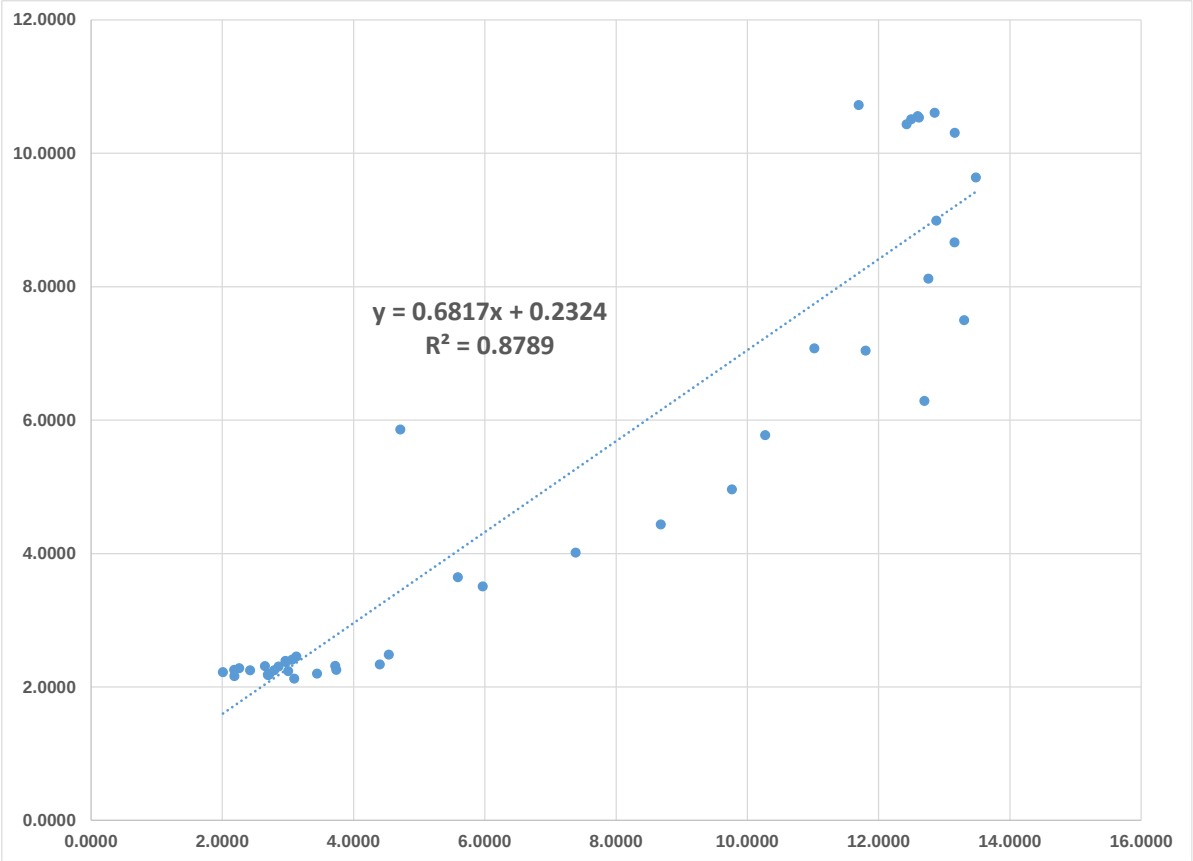

Figure 3:Correlogram of the interest rates for the banking system of Bulgaria and Raiffeisenbank (Bulgaria) EAD (44 observations: IQ2009 - IVQ2019)

Regression Statistics	
Multiple R	0.937514
R Square	0.878932
Adjusted R Square	0.876050
Standard Error	1.151795
Observations	44

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	1	404.5083	404.5083	304.9138	0.0000
Residual	42	55.7185	1.3266		
Total	43	460.2268			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*
Intercept	0.23236	0.32288	0.71966	0.47572	-0.41923	0.88395
Interest Ratio RFZ-BG	0.68168	0.03904	17.46178	0.00000	0.60290	0.76046

Table 1: Regression statistic and analysis of variation of interest revenues to interest expenses ratio on a quarterly basis of the banking system of Bulgaria and Raiffeisenbank (Bulgaria) EAD (44 observations: IQ2009 - IVQ2019)

3. SRESS TESTS AND BANK INSOLVENCY

3.1. The philosophy of stress tests

A study by (Apergis & Payne, 2013) with a focus on 90 EU banks found that the financial health of a credit institution is a function of its latest reporting indicators, along with the macroeconomic environment. This empirical conclusion supports the request of banking regulators to use an early warning system to monitor the "health" of banks. Stress tests themselves are subject to finding a unified international approach. As an alternative to the view of international standards for stress tests as a tool for early warning of bank insolvency, a number of central banks develop own methodologies. For example, the Bank of England applies the RAMSI (Risk Assessment Model of Systemic Institutions) model, which works in a top-down direction and is classified as a reliable way to assess the resilience of the financial system to the risks that British banks may face (Burrows et al. 2012). The stress test method of the Norwegian Central Bank (Norges Bank, The bank model and the stress test in the 2015 Financial Stability Report, 2015) and of the Bank of Lithuania (Bank of Lithuania, 2014) is similar. A study of (Haben, Friedrich, 2015) compares the stress tests methods in terms of three criteria:

- First criteria. The type of the test stress, where a distinction is made between stress tests conducted by macroprudential authorities for the purpose of assessing broad-system risks, stress tests conducted by microprudential authorities for supervisory purposes (Furlong, 2011) and internal stress tests conducted by the bank risk management for the purposes of assessing capital adequacy policies;
- Second criteria. Focus of the stress test, where a distinction is made between systematic assessments at the institutional level measuring basic solvency or liquidity (Basarir, Toraman, 2014a), assessments on the first and second pillars of Basel II, as well as assessments of financial instruments, investment portfolios, business branches from institutional positions for preparation of models for decision-making by the central bank management regarding reaction to the various risks.
- Third criteria. An approach to conducting the stress test, which is grouped into two categories, top - down and vice versa, bottom - up.

All three criteria provide options for action and objects of analysis and supervisory control, which in the context of unified policies of central banks reduce systemic risk and increase confidence in banking systems. In summary of the many studies in the scope of the problem of preparing and applying a reliable methodology for stress tests of banks as a way of early warning and response to bank insolvency, it can be concluded that the focus of monitoring are the balance sheet positions of the bank, the dynamics of credits and deposits (Wiszniowski, 2010b), as well as the effect of operating with them on the bank's capital and its adequacy in terms of capital adequacy ratios.

3.2. The banking crisis in Bulgaria with the insolvency of Corporate Commercial Bank - parameters and early warnings

The application of stress tests, Basel III capital adequacy requirements and the ECB's policy on building early warning systems in the event of bank insolvency are not only available to banking regulators at the end of the second decade of the 21st century, but are already the basis for decision-making regarding recommendations to specific credit institutions for recapitalization, incl. in the conditions of national applications to join the Banking Union. In terms of the bank insolvency of one of the systemic Bulgarian banks - Corporate Commercial Bank from 2014, of interest is the analysis and assessment of the balance sheet positions of the bank itself and of the banking system as a whole so that dependencies and indicators that can successfully play the role of warnings of the threat of entering into a regime of capital inadequacy and subsequent

bankruptcy can be identified. On this basis, we can conduct an analysis and assessment of the dynamics of interest revenues to interest expenses ratio of Corporate Commercial Bank and the banking system of Bulgaria for a period of 5 years; on a quarterly basis until the commencement of insolvency proceedings in 2014 year (see Fig. 3, Fig. 4 and Table 2).

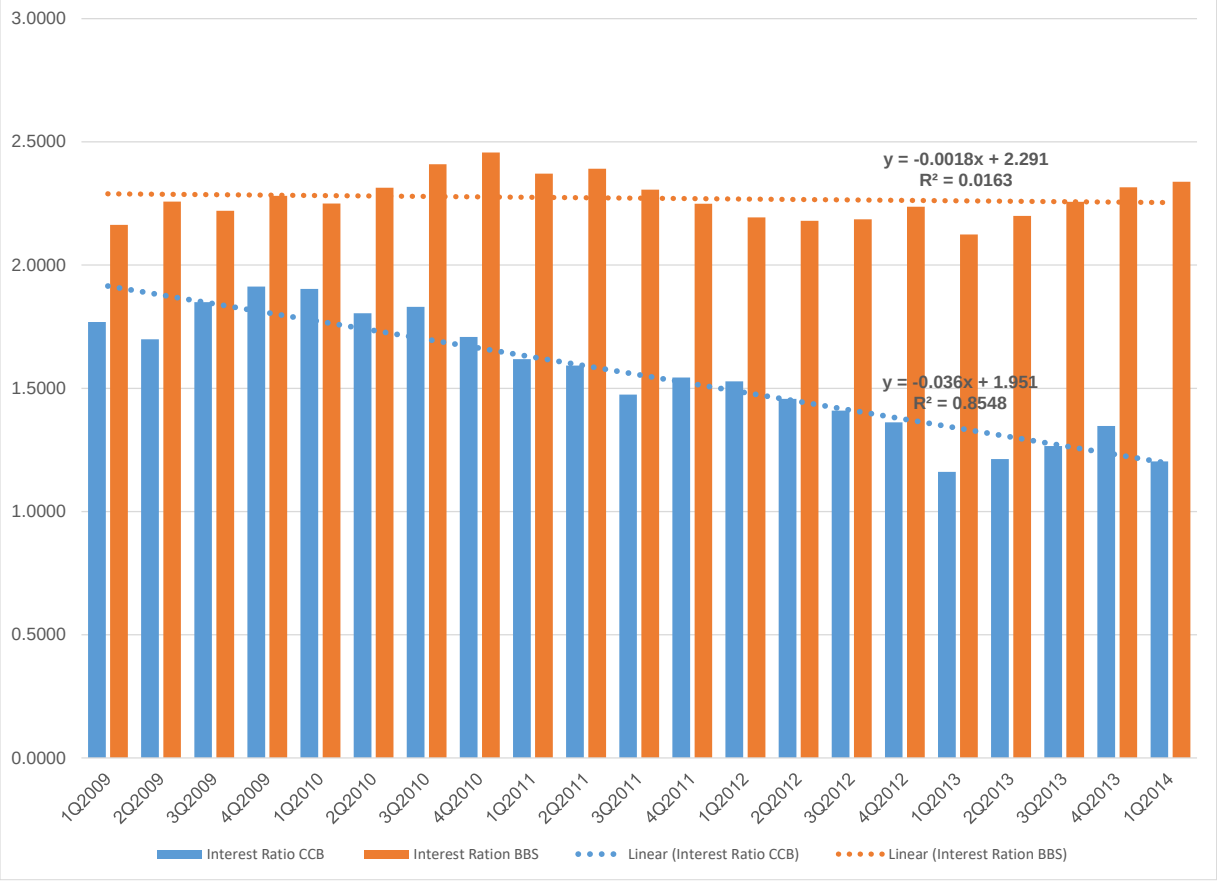

Figure 4: Interest revenues to interest expenses ratio on a quarterly basis of the banking system of Bulgaria and Corporate Commercial Bank (IQ2009-IQ2014)

The regression statistics clearly shows that between the two variables measuring the excess of interest revenues over interest expenses in the banking system and the Corporate Commercial Bank there is no statistically significant correlation on both Fisher's F-test and the coefficients of correlation of 0.297 and of determination of only 0.0885. The regression line of the trend for CCB has a stable negative slope and a high coefficient of determination of 0.8548.

Table following on the next page

Regression Statistics	
Multiple R	0.297564
R Square	0.088544
Adjusted R Square	0.040573
Standard Error	0.236723
Observations	21

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	1	0.103433	0.103433	1.845769	0.190189
Residual	19	1.064720	0.056038		
Total	20	1.168152			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*
Intercept	-0.314506	1.376927	-0.228412	0.821767	-3.196448	2.567435
X Variable 1	0.823046	0.605808	1.358591	0.190189	-0.444926	2.091017

Table 2: An analysis of the variation and regression statistics of the dependence of the interest rate of Corporate Commercial Bank on the interest rate of the banking system of Bulgaria for the period IQ'2009 - IQ'2013

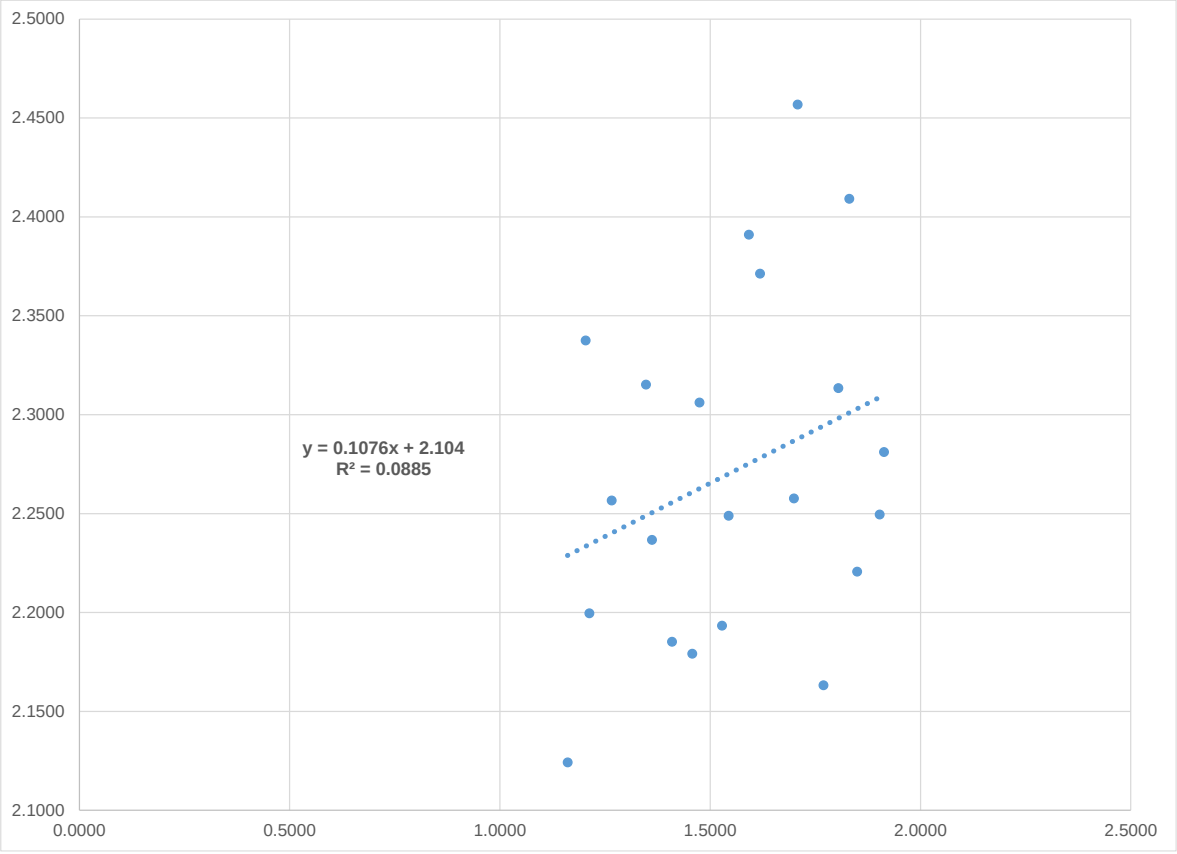

Figure 5: Correlogram of the interest rates for the banking system of Bulgaria and Corporate Commercial Bank (21 quarterly observations: 1Q2009 - IQ2014)

In contrast to the examined credit institution, the banking system maintains a stable level of the ratio of about 2.2 times the excess of interest revenues over interest expenses at close to zero slope of the regression trend line and also close to zero value of the coefficient of determination. The trend of the interest rate for CCB shows that by the end of 2014 there will be parity of interest revenues and interest expenses, which will automatically result in decapitalization and cessation of self-financing of growth. The interest rate for CCB itself deteriorates with a negative beta of minus 0.04 every quarter, which means that every three months the surplus of the excess of BGN revenues over BGN interest expenses shrinks by BGN 0.04 (1 EURO = BGN 1.95583) on a quarterly basis until reaching the last reported level of only 1.20 with an alpha coefficient of 1.95 for the starting level of the regression line. On this basis, it was logical that on November 6, 2014, the Governing Council of the BNB revoked the banking license of CCB AD. This decision has marked the beginning of a legally unprecedented process of managing the balance sheet positions and assets of a systemic commercial bank in insolvency proceedings and management by insolvency administrators. In a publicly announced final report of the insolvency administrators of the bank dated 23.9.2015, a 575-page detailed description of the found in the Corporate Commercial Bank disruption in the regulatory standards for capital adequacy with an expert valuation of the "perished" bank resources in the amount of over 4 billion (approximately equal to 4.5% of Bulgaria's GDP in 2015).

4. THE BANKING SYSTEM IN BULGARIA UNDER COVID-19

On April 9, 2020 the BNB Governing Council approved the submitted by the Association of Banks in Bulgaria draft Procedure for Deferral and Settlement of Liabilities Payable to Banks and their Subsidiaries - Financial Institutions in relation to the state of emergency enforced by the National Assembly on 13 March 2020. Once approved, the document constitutes a private moratoria within the meaning of the European Banking Authority (EBA) Guidelines on treatment of public and private moratoria in light of COVID-19 (EBA / GL / 2020/02). As of June 30, 2020, a total of 118,584 claims for liabilities with a gross carrying value of EUR 5 billion were submitted under the Procedure for deferral and settlement of liabilities payable to banks and their subsidiaries - financial institutions. Of these, 98,499 were approved for EUR 4.15 billion. The companies have requested 15,068 deferrals for EUR 3.85 billion, 13,156 of which have been approved for EUR 3.17 billion. 103,516 applications were submitted by households for EUR 1.14 billion, of which 85,343 applications were approved for EUR 0.98 billion (BNB, 2020). According to the first published data, the profit of the banking system of Bulgaria for 1H2020 is EUR 263.32 million (against EUR 469.4 million for the first six months of 2019). The total assets of the banking system amount to EUR 58.95 billion, increasing by 0.4 percent in June and by 0.1 percent compared to March 31, 2020. As of the end of June 2020 the banks in Bulgaria have granted loans to the amount of EUR 34.26 billion, 0.08% down to the previous reporting quarter. in IIQ2020 the deposits in the banking system increased by 0.3 percent and reaching EUR 50 billion by the end of June. This growth is due to households, non-financial corporations and the government sector. In the opposite direction a decrease was reported in the deposits of credit institutions and other financial entities. The equity in the balance sheet of the banking system increased in IIQ2020 by 1.0 percent and at the end of June amounted to EUR 7.52 billion. The liquidity coverage ratio of the banking system reached 258.0 per cent the liquidity buffer being EUR 15.6 billion. The deteriorating indicators for the banking system in the COVIOD-19 situation have their logical explanation. There is a significant rupture of value chains and supply chains in all economic sectors - from supply chains of agricultural products (Laktionova et al. 2019), to high-tech industries - with special emphasis on international trade. No less important is the role of China (Kostov, 2016) in international trade and its connection with the start of the pandemic. The desired effect can be assessed using various methods.

The fact is, however, that behavioural finance offers viable models that clearly explain the reasons for consumers' withdrawal from purchases and solvent demand. “All models of heterogeneous investors have significant potential as they cover a wide range of variables (real market restrictions), but the results of some studies are controversial and require additional testing. With models involving catastrophic events and survivorship bias, it seems that their basic assumptions have been consolidated as questionable” (Prodanov, Pavlov, 2016). Based on the information about a significant contraction in GDP for the economies of the United States and the European Union. “All models of heterogeneous investors have significant potential as they cover a wide range of variables (real market restrictions), but the results of some studies are controversial and require additional testing. With models involving catastrophic events and survivorship bias, it seems that their basic assumptions have been consolidated as questionable” (Prodanov, Pavlov, 2016a). Based on the information about a significant contraction of GDP of the economies of the United States and the European Union, it can be logically concluded that the health pandemic COVID-19 gave rise to an economic pandemic unknown in scale in world history.

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THE INFLUENCE OF COVID-19 ON TOURISM – THE CASE OF THE ISLAND OF HVAR

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ABSTRACT
The pandemic of Covid-19 is one of the largest shocks in the economy on the worldwide level. All economies have experienced the falls in GDP and rise of unemployment from the beginning of 2020. Croatia is one of such countries, where the influence on economy if very large. As Croatian economy is very much based in tourism, and tourism is suffering extremely during the pandemic period, the expectations about the fall of GDP are about 10% in 2020. The aim of this paper is to analyse the influence of Covid-19 pandemic on Croatian tourism, after 2019 which was the year of records with almost 20 million tourist arrival. The analysis will be done on the example of the island of Hvar, one of the most visited tourism destinations in Croatia. The island of Hvar is divided into 5 tourist places: Hvar (town), Stari Grad, Jelsa, Vrboska and Sućuraj. Each of these five places will be analysed and compared. The analysis will show how the number and the structure of tourists have changed due to the Covid-19.
Keywords*: Croatia, Hvar, tourism, Covid-19*

1. INTRODUCTION

The Covid-19 pandemic the ongoing pandemic od coronavirus which causes severe acute respiratory problems. It was first detected at the end of 2019 in China, and rapidly it started to appear in other countries. The first case of Covid-19 in Croatia was reported on 25 February 2020. In only two weeks the number of active cases surpassed 100, in April it surpassed 1000. At the end of April, the number of active cases started to fall, but starting from June, is was rising again. On 16 August the number of recorded cases in Croatia was 6500. The impact of Covid-19 pandemic in Croatia can be regarded through various fields, from education to economy and tourism. The whole education process was stopped in March and moved online. Schools had the daily television program, and universities used more sophisticated methods for video streaming of lectures and communication with students. Almost all culture and music events were postponed or cancelled. Sport competitions were stopped, churches were closed, restaurants and bars were partly closed and shops had the special regime. Due to the panic which occurred among citizens, shops were full of people buying larger quantities of milk, flower, oil, eggs, sugar, rice, meat, baby products, soaps, detergents and specially masks, gloves and disinfectants. This led to the rise of prices of these products, especially the last three mentioned. The prediction of the fall in GDP for 2020 vary from 7% to 10%. One of the key components of Croatian GDP is tourism. Tourism is traditionally a significant source of income, particularly during the summer months. Revenues from tourism are at the level of 20% of Croatian GDP, which is the highest share in the European Union. About 13% of all employees in Croatia work in tourism. These data show the importance of tourism for Croatian economy, and the aim of this paper is to analyse how Covid-19 has influenced Croatian tourism on the example of the island of Hvar, one of the most popular destinations in Croatia.

2. LITERATURE OVERVIEW

As Covid-19 is relatively new and unknown, not many researchers have analyzed how it influences tourism. Here are presented some of the most relevant researches. Present-day mass tourism uncannily resembles an auto-immune disease. Yet, self-destructive as it may be, it is also self-regenerating, changing its appearance and purpose.

They are two modes that stand in contrast to each other. We can see them as opposites that delimit a conceptual dimension ordering varieties of present-day mass tourism. The first pole calls forth tourism as a force leaving ruin and destruction in its wake or at best a sense of nostalgia for what has been lost, the other sees tourism as a force endlessly resuscitating and re-inventing itself. Kroes[1] highlights both sides of the story. These times of the Covid-19 pandemic, with large swathes of public life emptied by social lock-down, remind us of a second, cross-cutting conceptual dimension, ranging from public space brimming with human life to its post-apocalyptic opposite eerily empty and silent. The Covid-19 outbreak is a sharp reminder that pandemics, like other rarely occurring catastrophes, have happened in the past and will continue to happen in the future. Even if we cannot prevent dangerous viruses from emerging, we should prepare to dampen their effects on society. The current outbreak has had severe economic consequences across the globe, and it does not look like any country will be unaffected. This not only has consequences for the economy; all of society is affected, which has led to dramatic changes in how businesses act and consumers behave. This special issue is a global effort to address some of the pandemic-related issues affecting society. Naveen and Anders[2] analyze 13 papers that cover different industry sectors (e.g., tourism, retail, higher education), changes in consumer behavior and businesses, ethical issues, and aspects related to employees and leadership. Marianna[3] aims to critically review past and emerging literature to help professionals and researchers alike to better understand, manage and valorize both the tourism impacts and transformational affordance of Covid-19. To achieve this, first, the paper discusses why and how the Covid-19 can be a transformational opportunity by discussing the circumstances and the questions raised by the pandemic. By doing this, the author identifies the fundamental values, institutions and pre-assumptions that the tourism industry and academia should challenge and break through to advance and reset the research and practice frontiers. The paper continues by discussing the major impacts, behaviours and experiences that three major tourism stakeholders (namely tourism demand, supply and destination management organisations and policy makers) are experiencing during three Covid-19 stages (response, recovery and reset). This provides an overview of the type and scale of the Covid-19 tourism impacts and implications for tourism research. Unquestionable, the Covid-19 pandemic is one of the most impactful events of the 21st century and has tremendous effects on tourism. While many tourism researchers worldwide are currently 'Covid-19 research gap spotting', Zenker and Kock[4] call for more deliberateness and rigor. While they agree that the coronavirus pandemic is unique and relevant to research, they argue that not all effects are worth researching. Previous research on crises and disasters do show similar patterns and existing theories can often very well explain the current phenomena. Thus, six illustrative examples are shown how a research agenda could look like. This includes parts where theoretical explanations from tourism are missing, as well as where we think existing knowledge might be subject to a tourism paradigm-shift due to the coronavirus pandemic. The coronavirus pandemic has led to revenue loss for tourism enterprises and workers due to restrictions on movement. In response, governments have made available temporary financial support, but not to those tourist enterprises and workers in the undeclared economy. Reporting a 2019 Eurobarometer survey, Williams[5] reveals that one in 165 European citizens engage in undeclared work in tourism and the groups involved.

[1] Kroes, R. (2020) Present-Day Mass Tourism: its Imaginaries and Nightmare Scenarios, Society, Jul 2020
[2] Naveen, D.; Anders, G. (2020) Effects of COVID-19 on business and research, Journal of business research, Volume:117, Pages:284-289
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To bring these enterprises and workers onto the radar of the state, a voluntary disclosure initiative is advocated offering access to the temporary financial support for undeclared enterprises and workers disclosing their previous undeclared work. Caribbean islands that are highly dependent on tourism are facing compounding crises from climate-related disasters to the Covid-19 pandemic travel disruption. The rebuilding of tourism infrastructure has often been one of the main aims of international development aid and regional government responses to natural disasters. Sheller[6] seeks to identify other ways in which Caribbean small island states and non-independent territories might rebuild more sustainable ecologies and economies as they come out of the pandemic within the ongoing climate crisis. Farzanegan et al.[7] examine the relationship between international tourism and Covid-19 cases and associated deaths in more than 90 nations. They use a cross-country regression analysis and find a positive correlation between international tourism and the cumulated level of Covid-19 confirmed cases and death by April 30, 2020. The regression analyses show that countries exposed to high flows of international tourism are more prone to cases and deaths caused by the Covid-19 outbreak. This association is robust even after controlling for other socioeconomic determinants of Covid-19 outbreak and regional dummies. Based on the estimations, a 1% higher level of inbound and outbound tourism is associated with 1.2% and 1.4% higher levels of confirmed Covid-19 cases and death, respectively, controlling for other factors. After normalizing the number of cases and death by size of population, the statistical significance remains robust, especially for the Covid-19 deaths, while the effect size reduces. The Covid-19 is challenging the world. With no vaccine and limited medical capacity to treat the disease, nonpharmaceutical interventions are the main strategy to contain the pandemic. Unprecedented global travel restrictions and stay-at-home orders are causing the most severe disruption of the global economy since World War II. With international travel bans affecting over 90% of the world population and wide-spread restrictions on public gatherings and community mobility, tourism largely ceased in March 2020. Early evidence on impacts on air travel, cruises, and accommodations have been devastating. While highly uncertain, early projections from UNWTO for 2020 suggest international arrivals could decline by 20 to 30% relative to 2019. Tourism is especially susceptible to measures to counteract pandemics because of restricted mobility and social distancing. Gossling, Scott and Hall[8] compare the impacts of COVID-19 to previous epidemic/pandemics and other types of global crises and explores how the pandemic may change society, the economy, and tourism. They discuss why COVID-19 is an analogue to the ongoing climate crisis, and why there is a need to question the volume growth tourism model advocated by UNWTO, ICAO, CLIA, WTTC and other tourism organizations.

3. TOURISM IN CROATIA

Croatia is very well known tourist destination, famous by its summer tourism on the coast of the Adriatic see. With the area of 56594 km2 and the population of 4,28 million, Croatia is a smaller European country. The next table shows basic tourist indicators for Croatian Tourism.

Table following on the next page

[6] Sheller, M. (2020) Reconstructing tourism in the Caribbean: connecting pandemic recovery, climate resilience and sustainable tourism through mobility justice, Journal of Sustainable Tourism, Jul 2020

[7] Farzanegan, M.R.; Gholipour, H.F.; Feizi, M.; Nunkoo, R.; Andargoli, A.E. (2020) International Tourism and Outbreak of Coronavirus (COVID-19): A Cross-Country Analysis, Journal of Travel Research, Jul 2020

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	1980	1985	1990	1995	2000	2005	2010	2015
Number of beds (in 000)	692	820	863	609	710	909	910	1,029
Number of tourists (in 000)	7,929	10,125	8,498	2,438	7,136	9,995	10,604	14,343
Number of overnights (in 000)	53,600	67,665	52,523	12,885	39,183	51,421	56,416	71,605
Average number of overnights per bed	77	83	61	21	55	57	62	70
Average number of overnights per tourist arrival	6.8	6.7	6.2	5.3	5.5	5.1	5.3	5

Table 1: Basic indicators of tourism development in Croatia
(Source: HTZ: Tourism in Figures 2019)

Croatian tourism had a significant fall during the years of the war (the first half of 1990s). During that period the number of tourists and the number of overnights have significantly fallen. In 2010s, these numbers have recovered completely, and in 2015 Croatia achieved more than one million tourist beds. Besides the number of beds, the number of tourists and the number of overnights which are rising, the average number of overnights per tourist arrival is falling and in 2015 it is 5. In 2019 these numbers were even better. The number of tourist arrivals is 19,56 million and the number of overnights 91,24, of which over 90% are foreign tourists. But the average number of overnights fell down to only 4,6.

	ARRIVALS	OVERNIGHTS
January	207,643	504,434
February	264,484	549,613
March	449,620	943,716
April	1,105,999	2,975,446
May	1,569,271	4,916,614
June	2,921,391	13,016,832
July	4,325,686	25,522,680
August	4,712,039	27,771,360
September	2,170,611	10,365,761
October	1,076,316	3,080,470
November	390,886	819,266
December	372,200	776,739

Table 2: Tourist arrivals and overnights in 2019
(Source: HTZ: Tourism in Figures 2019)

As Table 2 shows, the majority of tourist arrivals and overnights occur in July and August. These two months generate over 50% of annual tourist overnights in Croatia. Adding here June and September, this share grows over 80%. This is the confirmation why summer tourist is so important for Croatia.

4. TOURISM ON THE ISLAND OF HVAR

Hvar is an island in the central Dalmatia, the fourth biggest island in Croatia. It has a surface of 300 km2 and 12000 inhabitants. The climate on Hvar is characterized by mild winters, and warm summers. Hvar is the island with 2715 hours of sunshine per year – the record in Croatia. Tourism has been growing on Hvar since the middle on 19th century, and today it is the most important contributor to the economy of the island.

The island of Hvar has been declared many times as one of the most beautiful island in the world, and it represents one of the major tourist destinations in Croatia. The island of Hvar has four municipalities: Hvar (town), Stari Grad, Jelsa and Sućuraj. The municipality of Jelsa consists of two important tourist destinations: Jelsa and Vrboska. So we can conclude that there are 5 main tourist destinations on the island of Hvar: Hvar, Stari Grad, Jelsa, Vrboska and Sućuraj.

	Arrivals	Overnights
Hvar	209182	715462
Stari Grad	35238	226256
Jelsa	63426	451593
Vrboska	16115	127883
Sućuraj	8439	69030
Total - island	*332400*	*1590224*

Table 3: Tourist arrivals and overnights in 2019
(Source: Turistička zajednica SDŽ: Statistička analiza turističkog prometa 2019.)

Table 3 shows the number of tourist arrivals and overnights on the island of Hvar. Most tourist have visited the town of Hvar – 209182, which is 63% of all tourists on the island. The whole island of Hvar achieved 332400 tourist arrivals in 2019. The town of Hvar also achieved the highest number of tourist overnights in 2019 – 715462, which is 45% of all overnights on the island. The total number of tourist overnights on the island of Hvar in 2019 was 1590224. From these number we can calculate the average number of overnights.

	Average nights
Hvar	3,42
Stari Grad	6,42
Jelsa	7,12
Vrboska	7,94
Sućuraj	8,18
Total - island	4,78

Table 4: The average number of tourist overnights

Hvar has only 3,42 and Sućuraj 8,18 overnights per tourist on average. From all tourist destinations, the town of Hvar if the one where tourist spend only slightly more than three days. This gives a little bit different picture. We could conclude that here lower number of tourists is correlated to the longer stay. The coefficient of correlation between these two variables is -0,96.

5. TOURIST STRUCTURE ON THE ISLAND OF HVAR

After the discussion about the number of arrivals and overnights, it is now interesting to see which countries do tourists come from. For each destination on the island of Hvar we will show the top 5 countries, according to the number of tourist arrivals in 2019. Based on that and the number of overnight, we also show the average number of overnights.

Table following on the next page

Country	*Arrivals*	*Overnights*	*Average*
UK	31001	115115	3,71
USA	30736	74970	2,44
China	11545	13458	1,17
France	10099	30134	2,98
Australia	9373	25185	2,69

Table 5: Top 5 countries for Hvar in 2019

Country	*Arrivals*	*Overnights*	*Average*
Czechia	4419	32314	7,31
Slovenia	3568	27061	7,58
Poland	2810	19204	6,83
France	2065	7610	3,69
Germany	1643	13996	8,52

Table 6: Top 5 countries for Stari Grad in 2019

Country	*Arrivals*	*Overnights*	*Average*
Slovenia	8523	77511	9,09
Czechia	7458	63736	8,55
Germany	5800	46371	8,00
Poland	5733	47192	8,23
Slovakia	3433	28769	8,38

Table 7: Top 5 countries for Jelsa in 2019

Country	*Arrivals*	*Overnights*	*Average*
Germany	2586	26549	10,27
France	1677	9989	5,96
UK	1646	10763	6,54
Slovenia	1314	14189	10,80
Austria	891	8246	9,25

Table 8: Top 5 countries for Vrboska in 2019

Country	*Arrivals*	*Overnights*	*Average*
Czechia	1677	14383	8,58
Slovakia	1003	8975	8,95
Slovenia	899	9754	10,85
Germany	864	7019	8,12
Poland	765	6334	8,28

Table 9: Top 5 countries for Sućuraj in 2019

If we compare these five tables, it is interesting that similar tourist visit Stari Grad, Jelsa, Vrboska and Sućuraj, while completely other tourist structure occurs in Hvar. From top 5 countries in Hvar, three are non-european countries. In all four other destinations, in top 5 there are only tourists from European countries. Germany and Slovenia are among top 5 in all destinations except the town of Hvar. From all these analysed groups of tourists, Slovenian tourists have the longest stay, over 10 nights on average), and Chinese tourists stay very short

– usually only one night. From top 5 in the town of Hvar, only UK tourists stay more than 3 days. This is the reason why the town of Hvar has significantly lower value of average overnights. It is important to say that the town of Hvar used to have similar structure of tourists some 10-20 years ago, and then the situation started to change. Hvar became popular among young tourists (mostly interested in parties) who are staying very short on one place. This has risen the prices in the town of Hvar, which is today one of the most expensive places in Croatia.

6. TOURISM DURING COVID-19 ON THE ISLAND OF HVAR

As the Covid-19 started in Europe in this year, it is only possible to compare this year to the previous one. As at the time of writing this paper the last data are for July 2020, this analysis includes first 7 months of 2020 and compare this to first 7 months of 2019. This is the limitation of this paper – in future researches it would be interesting to compare the whole year 2020.

	Hvar			Stari Grad			Jelsa		
	2020	2019	change	2020	2019	change	2020	2019	change
I	108	59	83,1%	57	52	9,6%	44	18	144,4%
II	160	140	14,3%	63	44	43,2%	29	33	-12,1%
III	79	588	-86,6%	120	81	48,1%	69	50	38,0%
IV	13	6062	-99,8%	24	528	-95,5%	8	923	-99,1%
V	67	19619	-99,7%	46	1446	-96,8%	99	3499	-97,2%
VI	2613	36115	-92,8%	723	6626	-89,1%	4097	10839	-62,2%
VII	16517	52007	-68,2%	4142	10567	-60,8%	12736	19604	-35,0%

	Vrboska			Sućuraj		
	2020	2019	change	2020	2019	change
I	3	0	-	21	10	110,0%
II	2	2	0,0%	7	10	-30,0%
III	9	0	-	20	12	66,7%
IV	0	566	-100,0%	1	60	-98,3%
V	7	1235	-99,4%	14	121	-88,4%
VI	726	2603	-72,1%	736	1138	-35,3%
VII	2432	4643	-47,6%	2202	3222	-31,7%

Table 10: Tourist arrivals in 2019 and 2020 by month from January to July (Source: Turistička zajednica Splitsko-dalmatinske županije)

The data from the table show the fall of tourist arrivals in all five tourist destinations on the island of Hvar. Starting from May, as the first important tourist month, the falls were up to 99,7% in 2020 compared to 2019. The largest fall in the number of tourist arrivals occurred in the Town of Hvar, while lowest fall occurred in Sućuraj. This is due to two important reasons: the proximity of the destination to the guests and the loyalty of the guests. Guests who have already visited the destination are much more common in Stari Grad, Jelsa, Vrboska and Sućuraj, than in Hvar.

Table following on the next page

	Hvar			Stari Grad			Jelsa		
	2020	2019	change	2020	2019	change	2020	2019	change
I	1364	519	162,8%	893	357	150,1%	753	287	162,4%
II	1349	1105	22,1%	1245	570	118,4%	651	550	18,4%
III	1134	1748	-35,1%	2197	959	129,1%	1136	666	70,6%
IV	1040	14316	-92,7%	1785	2406	-25,8%	922	3126	-70,5%
V	586	49323	-98,8%	1137	6604	-82,8%	760	13634	-94,4%
VI	13245	112889	-88,3%	4212	36780	-88,5%	24871	60860	-59,1%
VII	105574	377466	-72,0%	41285	117236	-64,8%	141896	232589	-39,0%

	Vrboska			Sućuraj		
	2020	2019	change	2020	2019	change
I	56	0	-	203	168	20,8%
II	24	16	50,0%	255	276	-7,6%
III	187	0	-	349	212	64,6%
IV	202	2898	-93,0%	216	410	-47,3%
V	75	9571	-99,2%	155	505	-69,3%
VI	5330	19980	-73,3%	4680	6192	-24,4%
VII	27850	69008	-59,6%	25636	35059	-26,9%

Table 11: Tourist overnights in 2019 and 2020 by month from January to July (Source: Turistička zajednica Splitsko-dalmatinske županije)

If we compare the number of tourist overnights, the situation is similar. There is a significant fall in 2020 compared to 2019. Starting from May, this fall went up to 99,2%. Similar to the number of arrivals, the largest fall in the number of overnights occurred in Hvar and the lowest in Sućuraj. Compared cumulatively for the first 7 months, the largest fall in the number of arrivals is in Hvar (-83%), followed by Stari Grad (-73%), Vrboska (-65%), Jelsa (-51%) and Sućuraj (-34%). The same for the number of overnights shows similar results – the largest fall is in Hvar (-72%), followed by Stari Grad (-65%), Vrboska (-60%), Jelsa (-39%) and Sućuraj (-27%). All these changes have led to the change in the average number of overnights. In the town of Hvar it rose to 5,38. In all other destinations on the island it is also higher - Stari Grad 7,95, Jelsa 8,29, Vrboska 8,74 and Sućuraj 8,55. In all tourist destinations on the island of Hvar tourists stay longer this year compared to 2019. The highest jump occurred in Hvar – tourist stay 57% longer this year.

7. CONCLUSION

This paper represents the analysis of the tourist results for the first seven months of 2020, which is the last available data at the time of writing, for the island of Hvar as one of the most important destinations in Croatia. Covid-19 pandemic has influenced tourism on the worldwide level, and Croatian tourism has suffered with no exception. After the record year 2019, in 2020 Croatia will experience fall in tourist arrivals and overnights, the only question is how large these falls will be. According to the data for the island of Hvar, the falls go up till 100% compared to the previous year. Besides the fall in tourist arrivals and overnights, the structure of the guests has also changed. Tourists from non-european countries are now very rare, for them it is extremely complicated to arrive to Croatia. This means that the majority of tourists arrive from European countries. For some destination on the island of Hvar this is a significant change, as for the town of Hvar. Other destinations have traditionally the majority of European guests, so for them this change did not occur. The analysis showed also some good indicators.

Despite the fall of the number of arrivals and overnights, tourists which have visited Hvar in 2020 have stayed longer, on average. In the town of Hvar, the overage number of overnights in 2019 was 3,42, and in 2020 it rose to 5,38. In all other four destinations on the island of Hvar this number has also risen in 2020. The limitations of this paper emerge from the fact that it was written during the summer 2020, and there are no data about the whole year. Because of that, for further research it would be interesting to compare the whole 2020 to 2019, as well as to extend the analysis to some other destinations in Croatia or other countries.

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LABOR PRODUCTIVITY IN THE COMPLEX INTERPLAY BETWEEN HEALTH AND WELL-BEING OF OLDER EMPLOYEES: A FOCUS ON THE NEW EUROPEAN UNION MEMBER STATES UNDER THE COVID-19 PANDEMIC CRISIS

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ABSTRACT

The COVID-19 pandemic crisis has severely impacted the good health and well-being of people around the world. On these unforeseen challenges, decision makers reconfigure advanced resilient policies and strategies for the labor markets, which have already been deeply impacted by the amplitude of the ageing phenomenon (downsized birth rate jointly with an increasing life expectancy). Consequently, the general objective of our research is to assay the labor market productivity of workers in the New European Union (EU) Member States under the complex implications of older employment and ageing dimensions, significantly shaped by health and well-being. The methodological approach consisted in applying the structural equation modelling (SEM) technique on a large dataset covering the 1995-2017 lapse of time. The results obtained revealed the need for older employment (55-64 years) reconfiguration, on the one hand, by: further sustaining the educational programs, new labor market policies (active and passive) and increasing the public allocations for research & development, especially adapted for nowadays digital online working. On the other hand, the weightiness of government expenditures dedicated for improving the health perceptions for sustainable good health and well-being, jointly with better health conditions of older people, will lead to an increased life expectancy, emphasized birth rate and tackled poverty, with cumulative positive effects on the labor market productivity in EU countries.

Keywords: *Ageing phenomenon, Health, Labor productivity, New European Union countries, Welfare*

1. INTRODUCTION

Demographic ageing, reflected by an upturn in life expectancy, simultaneously with the reduction of the birth/fertility ratio (Thalassinos et al., 2019; Cristea and Mitrica, 2016), represents a phenomenon that affects all countries in the world, both developed and developing

ones. Its implications for economic and social life are manifold. Workforce ageing and the impact on labor productivity represents a relevant area of research since this demographic change has important consequences on the economic activity, social security systems and the well-being of the population (Calvo-Sotomayor et al., 2019; Cristea et al., 2020). Despite its significance, the research that brings solid evidence for bridging demographic ageing with labor productivity in the framework of health and well-being of older workers still needs to be strengthen by additional empirical evidence, in order to provide strategic guidelines for policy makers and responsible authorities. Current study undertakes these important issues and configures an ambitious empirical research to strengthen the knowledge in this field. Based on the literature underpinnings and nowadays challenges for the ageing population induced by worldwide infections with SARS-CoV-2 (Petretto and Pili, 2020), the general objective of our research is to assay the labor market productivity of workers in the New European Union (EU) Member States (a number of 13 countries that have adhered since 2004, EU-13, namely Croatia, Bulgaria, Romania, Hungary, Slovenia, Slovakia, Poland, Malta, Lithuania, Latvia, Estonia, the Czech Republic and Cyprus), under the complex implications of older employment and ageing dimensions, significantly shaped by health and well-being. Our methodology comprises structural equation modelling with latent class analysis (SEM – LCA), for the 1995-2017 time span. The structure of the paper comprises a concise introduction on the motivation and relevance of the research endeavour centered on assessing the ageing population and its implications on labor productivity, followed by a brief critical review of the literature and a complex empirical analysis, based on structural equations. Detailed results, discussion and concluding remarks are encompassed in the final parts of the paper, supported by additional information in the appendix.

2. BRIEF LITERATURE REVIEW

Numerous studies in this scientific field shed light on both a positive and a negative relationship between demographic ageing and labor productivity. While most of the studies addressing this issue find a negative interdependency or even no connection (Aiyar et al., 2016; Feyrer, 2008; Maestas et al., 2016), the literature that evidences a positive relationship is quite small (Cristea, Noja, Stefea et al., 2020; Liu and Westelius, 2016). Skirbekk (2005) entails that population ageing has a negative impact on labor productivity due to the fact that a series of workers' skills decline with age (such as physical strength, speed, health or learning capacity). On the other hand, Cristea, Noja, Stefea et al. (2020, p. 1367) evidenced that "a proper labour market insertion of the population aged 55-64 years, placed under the indirect and bidirectional influence of the other selected factors, induced positive effects upon labour productivity". Feyrer (2008) outlined the importance of the age structure in the interplay between ageing and productivity and attested that changes in workforce age structure are strongly correlated with productivity. Educational attainment, long-life training activities, workplace innovations (Sharpe, 2011; Taylor, 2006; Thang, 2011) and labour market policies, such us "job-redesign" (Christelis and Fonseca, 2016) represent relevant factors for enhancing labor productivity of the worforce aged 55-64 years. Earnings bring also a meaningful motivation of older employees (55-64 years) for better outputs at the workplace, thus inducing a higher labor productivity (Thang, 2011). At the same time, people's good health and well-being are also important credentials that affect labour productivity, particularly in the case of older workers (Cristea, Noja, Danacica et al., 2020; Cristea, Noja, Stefea et al., 2020; Kwan and Walsh, 2018; Randel et al., 2017), this issue being highly relevant in the present context of Covid-19 pandemic crisis. On these lines, Randel et al. (2017, p. 2) outline that „poverty and exclusion remain the greatest threats to the well-being of older people all over the world". Petretto and Pili (2020, p. 2) highlight that „old adults could also face great barriers to access to the health service and support, including an age-based discrimination, also for diseases and disorders different from

the ones caused by COVID-19". Upon reviewing existing studies, their findings and limitations, this research proposes a new integrated empirical model to assess the interplay between the population ageing and labor productivity, with a keen focus on the role played by health and well-being of older employees.

3. DATA AND METHODOLOGY

The variables included for our research are grouped into three main categories, as follows (descriptive statistics are comprised in the Appendix, Table A1):

- *ageing indicators*: "Crude birth rate (number of live births per 1000 people)" (*BR*); "Life expectancy at birth total population" (years) (*LE*) (SDG indicator, Goal 3 "Good health and well-being", [SDG_03_20]); "Old dependency ratio (population 65+ to population 15-64 years)" (%) (OD_65);
- *health indicators*: "Health government expenditure" (% of GDP) (*HGE*); "Healthy life years in absolute value at 65 - females (years)" (*HLY_F*); "Healthy life years in absolute value at 65 - males (years)" (*HLY_M*); "Share of people aged 16+ with good or very good perceived health" (%) (SDG indicator, Goal 3 "Good health and well-being", [SDG_03_20]) (%) (*PGPH*);
- *other economic and social variables*: "Labor productivity per person employed and hour worked (% from the EU-28 average)" (*LP*); "Employment rate, 55–64-year-old group" (% of total population) (*ER_55_64*); "At-risk-of-poverty-rate of older people, 65+" (%) (*POV_R_65*); "Annual net earnings of a two-earner married couple with two children (Purchasing Power Standard)" (*EARN*); "Population with secondary, upper, post-secondary and tertiary education (levels 3-8) (% of 15–64 years)" (*EDU*); "Tertiary education level 30-34 age group (% of the population aged 30–34)" (*TE_30_34*); "Active labor market policies" (% of GDP) (*ALMP*); "Passive labor market policies" (% of GDP) (*PLMP*); "Total research and development expenditures" (% of GDP) (*GERD*).

The indicators for the new EU-13 countries were extracted from the Eurostat database (European Commission, 2019a) and the Employment, Social Affairs & Inclusion (European Commission, 2019b), for the period 1995-2017. Preliminary processing of the data consisted in applying the logarithmic procedure in order to ensure an adequate comparison between countries. The methodology consisted in structural equation modelling - latent class analysis (SEM – LCA). SEMs are a tool used in the analysis of multivariate data, being applied mainly for testing theories in social sciences, demography and economics (Acock, 2013; Bollen, 2014), much more complex than general regression models because they incorporate multiple dependent and independent variables, in their direct, indirect and total connection, as well as latent hypothetical constructions (latent class analysis, LCA), represented by groups of observed variables. The set of structural equations is found in the form of a matrix, as follows (equation 1) (Westland, 2015):

$$\begin{bmatrix} Y_1 \\ Y_2 \\ Y_3 \end{bmatrix} = \begin{bmatrix} \alpha_1 \\ \alpha_2 \\ \alpha_3 \end{bmatrix} + \begin{bmatrix} 0 & 0 & 0 \\ \beta_{21} & 0 & 0 \\ \beta_{31} & \beta_{32} & 0 \end{bmatrix} \begin{bmatrix} Y_1 \\ Y_2 \\ Y_3 \end{bmatrix} + \begin{bmatrix} \gamma_{11} \\ \gamma_{21} \\ \gamma_{31} \end{bmatrix} [X_1] + \begin{bmatrix} \varepsilon_1 \\ \varepsilon_2 \\ \varepsilon_3 \end{bmatrix} \quad (1)$$

where:

α – the intercept associated with each endogenous/dependent variable (Y);

β – path or standardized path coefficient in the regression of endogenous variables over other endogenous variables;

γ – the structural coefficient in the regression of endogenous variables over exogenous variables (X);

ε – the error term associated with an endogenous variable.

Thereby, in our analysis, SEMs offer an integrated analysis (direct, indirect and total) of labor productivity under the cumulative implications of health, ageing dimensions and older employment (55-64 years) at the level of the new EU-13 countries (mainly, developing countries). General configuration of our SEM-LCA model (Figure 1) grasps the following causalities: older employment (55-64 years) effects on labor productivity, given the relevant underpinnings from the literature (Cristea, Noja, Danacica et al., 2020; Cristea, Noja, Stefea et al., 2020; Thang, 2011), under indirect implications of wages/earnings (Fisman and Luca, 2018; Thang, 2011), education (Sharpe, 2011; Taylor, 2006; Thang, 2011), public research and development (R&D) support (Thang, 2011), policies from the labor market (active and passive) (Christelis and Fonseca, 2016; Noja, Danacica et al., 2020; Cristea, Noja, Stefea et al., 2020) and older dependency ratio (Soong, 2019); ageing dimensions, reflected by birth rate and life expectancy (Grundy and Murphy, 2017), under the implications of perceived health (as a relevant SDG indicator) (Varvarigos and Zakaria, 2013), well-being (reflected by poverty of people over 65 years old), older people's health conditions (over 65 years old), women and men, and public health allocations from GDP (Anyanwu and Erhijakpor, 2009; Ray and Linden, 2020).

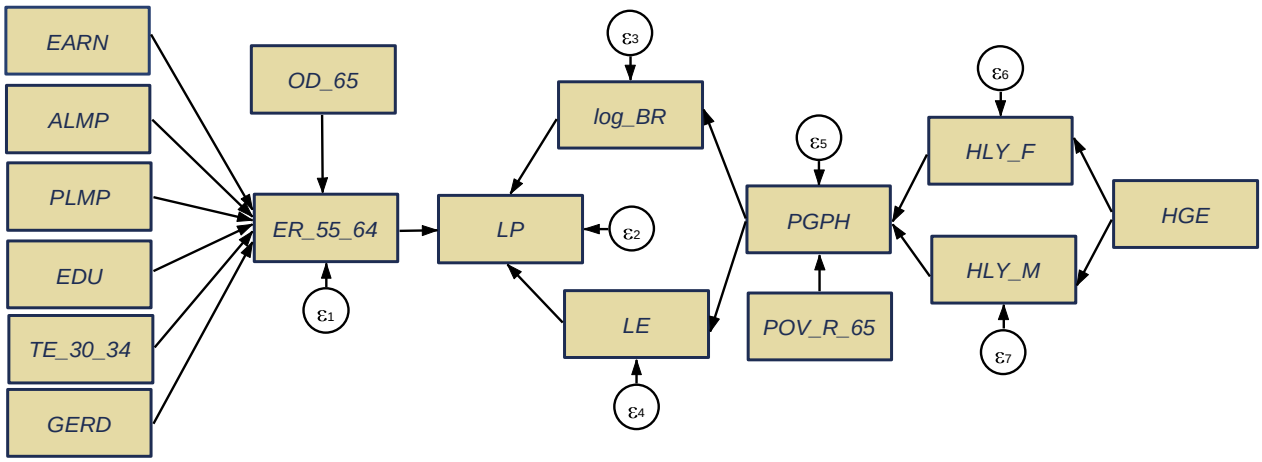

Figure 1: General configuration of SEM for EU-13
(Source: own contribution in Stata 16)

As such, consistent to our general objective and SEM configuration, we target the following the research hypotheses (H):

- H_1. Labor productivity is directly influenced by the employment of older workers (55-64 years), under the indirect effects of selected socio-economic factors;
- H_2. Public health expenditures positively influence older people's health conditions and people's good perceived health, with cumulative effects on the ageing dimensions;
- H_3. Labor productivity is significantly shaped by the overall influence of ageing and health dimensions.

4. RESULTS AND DISCUSSION

The results of the SEM model for EU-13 countries (Figure 2 and Table A2 from Appendix) are supported by matching tests, respectively Wald tests for equations (Table A3 from Appendix) and goodness-of-fit tests (Table A3 from Appendix).

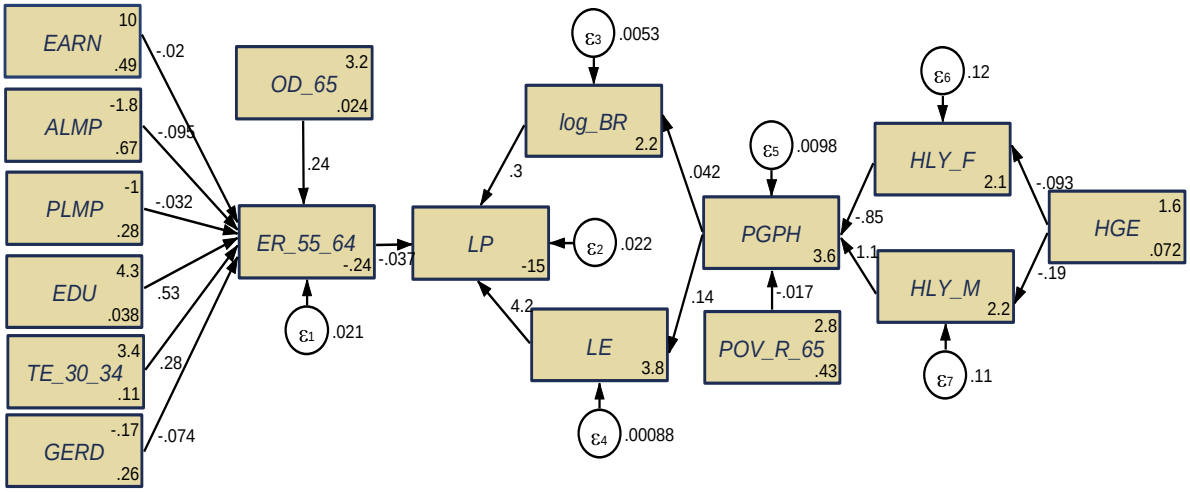

Figure 2: SEM results for EU-13
(Source: own contribution in Stata 16)

We note that the coefficient of determination (CD) is 0.528, meaning that 52.8% of the variation in labor productivity is under the influence of selected variables (can be explained by the variations in selected variables). Employment rate of older population aged 55-64 years (*ER_55_64*) within the EU-13 countries is under the favorable direct influence of the educational impacts (*EDU* and *TE-30_34*), significant from the statistical point of view (p<0.001, coefficients are 0.531, respectively 0.285) and older dependency ratio (p<0.001, coefficient is 0.236). Opposite, unfavorable implications were induced by the active labor market policies (*ALMP*) (p<0.001, coefficient is -0.0948) and public allocation support for R&D (*GERD*) (p<0.05, coefficient is -0.0744). These results disclose the following: further sustained policies for education, adapted to these challenging days of online teaching, due to SARS-CoV-2 virus infections; enhancement of the employment rate of the population aged between 15-64 years in order to keep up the pace with the increasing share of population over 65 years; better motivation and incentives for older workers employed (55-64 years old), reflected by adjusted active labor market policies, as they are configured by developed countries, especially the Nordic ones (Vooren et al., 2019), a higher allocation of public expenditures for R&D, oriented, particularly, to jobs designed for the labor force aged between 55-64 years in order to ease this category. Total impact of the employment rate of the older population 55-64 years (*ER_55_64*) on labor productivity is unfavorable but not significant from the statistical point of view, which shows that our 1st hypothesis, H_1. *Labor productivity is directly influenced by the employment of older workers (55-64 years), under the indirect effects of selected socio-economic factors,* is not entirely verified. The influence of public health expenditures (*HGE*) on older people's health condition (males and females) is negative, but not significant from the statistical point of view. Nevertheless, older women's (65+) health condition significantly and negatively influences people's good perceived health (*PGPH*) (p<0.001, coefficient is -0.847), while the older men's health (65+) one (p<0.001, coefficient is 1.144) is positively associated with *PGPH*. The influence of older people's well-being (reflected through the poverty rate of older people, 65+) on *PGPH* is negative, still, not significant from a statistical point of view. Total influences of health dimensions on ageing credentials show favorable interlinkages upon life expectancy (p<0.001, coefficient is 0.141), while for the birth rate, the effects are not statistically supported. Hence, our 2nd hypothesis, H_2. *Public health expenditures positively influence older people's health conditions and people's good perceived health, with cumulative effects on the ageing dimensions,* is partially fulfilled. Finally, labor productivity into EU-13 countries is significantly shaped by a raising life expectancy (p<0.001, coefficient is 4.242), under the indirect effects of health dimensions,

while for the birth rate, the effects are not statistically supported. Therefore, our 3rd hypothesis, *H_3. Labor productivity is significantly shaped by the overall influence of ageing and health dimensions*, is, also, partially fulfilled.

5. CONCLUSIONS

This study undertook the important issue of bridging ageing with labor productivity in the interplay between older workers' health and well-being and configured a comprehensive theoretical and empirical research to strengthen the knowledge in this field. Our research was driven by the needs of addressing the New EU countries' responses to the ageing phenomenon. It provides accurate empirical evidence on how labor productivity of workers in these countries is shaped under the complex implications of older employment and ageing dimensions, further connected to health and well-being. Three research hypotheses were employed in this respect, assessed through structural equation modelling, and partially validated in this framework of analysis. Several main findings emerge from the study performed: there is an essential need for sustained educational policies anchored in the credentials of a digital economy and online teaching, particularly in these challenging pandemic times; newly configured labor market policies, particularly active labor market policies, tailored to the needs of older workers, designed to significantly increase their labor market performance (reflected through upturns in the employment rate of population aged 15-64 years); higher allocations of public expenditures for R&D and for the healthcare system. The main limitations of this research may rely on the fact that some of the countries considered in our sample did not have complete data series for the entire analyzed timespan. Future research directions grasp a deeper understanding of the mechanisms that provoke a negative interplay between population ageing and labor productivity, in addition to older workers' health and well-being implications.

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APPENDIX

Variables	*N*	*mean*	*sd*	*min*	*max*
LP	169	70.75858	14.42612	35.7	96.1
ER_55_64	261	41.49157	11.0632	17.1	68.1
GERD	299	.8074314	.4609393	.024	2.604
EDU	299	71.79532	14.59404	17.1	88
EARN	273	35414.8	43926.32	666.42	265212
LE	273	75.16593	3.220439	67.7	82.7
BR	299	10.07358	1.053504	7.6	15.2
OD_65	293	22.30887	3.798899	16.3	31.8
TE_30_34	299	26.13512	12.49351	1	58.7
ALMP	161	.2024037	.1598259	.019	.873
PLMP	162	.3844074	.2232345	.065	1.365
POV_R_65	140	19.98786	11.30065	4.1	52
HLY_F	161	7.165217	2.504128	2.7	14.2
HLY_M	161	7.017391	2.335047	3	13.5
HGE	289	4.975779	1.415306	1.8	7.9
PGPH	164	59.72256	9.925003	35	80.3
log_LP	169	4.235633	.2267142	3.575151	4.565389
log_ER_55_64	261	3.687213	.2843992	2.839078	4.220977
log_GERD	299	-.3640101	.5669236	-3.729702	.9570488
log_EDU	299	4.24058	.29538	2.839078	4.477337
log_EARN	273	10.0157	.9378622	6.50192	12.48829
log_LE	273	4.318788	.0426822	4.215086	4.41522
log_BR	299	2.304702	.1013955	2.028148	2.721295
log_OD_65	293	3.090508	.1707148	2.791165	3.459466
log_TE_30_34	299	3.129542	.5635107	0	4.07244
log_ALMP	161	-1.878574	.7889157	-3.963316	-.1358197
log_PLMP	162	-1.104705	.5527545	-2.733368	.3111544
log_POV_R_65	140	2.811008	.6461677	1.410987	3.951244
log_HLY_F	161	1.908461	.3540796	.9932518	2.653242
log_HLY_M	161	1.894291	.3314473	1.098612	2.60269
log_HGE	289	1.558653	.3164352	.5877866	2.066863
log_PGPH	164	4.075466	.1712212	3.555348	4.38577
N	299				

Table A1: Summary statistics for EU-13, 1995-2017
(Source: Own contribution in Stata 16)

Table following on the next page

Variables	*Results*	*Variables*	*Results*
log_ER_55_64		log_LP	
log_EARN	-0.0203 (0.0227)	log_ER_55_64	-0.0371 (0.0769)
log_ALMP	-0.0948*** (0.0208)	log_BR	0.301 (0.214)
log_PLMP	-0.0318 (0.0292)	log_LE	4.242*** (0.398)
log_EDU_ATT	0.531*** (0.0869)	_cons	-14.71*** (1.749)
log_TE_30_34	0.285*** (0.0508)	log_BR	
log_GERD	-0.0744* (0.0314)	log_PGPH	0.0420 (0.0430)
log_OD_65	0.236* (0.108)	_cons	2.158*** (0.176)
_cons	-0.243 (0.617)	log_PGPH	
log_LE		log_HLY_F	-0.847*** (0.0915)
log_PGPH	0.141*** (0.0175)	log_HLY_M	1.144*** (0.0978)
_cons	3.761*** (0.0716)	log_POV_R_65	-0.0169 (0.0146)
log_HLY_F		_cons	3.580*** (0.0620)
log_HGE	-0.0933 (0.124)	log_HLY_M	
_cons	2.065*** (0.204)	log_HGE	-0.188 (0.115)
var(e.log_ER_55_64)		_cons	2.203*** (0.190)
_cons	0.0213*** (0.00284)	var(e.log_PGPH)	
var(e.log_LP)		_cons	0.00980*** (0.00131)
_cons	0.0216*** (0.00288)	var(e.log_HLY_F)	
var(e.log_BR)		_cons	0.124*** (0.0166)
_cons	0.00529*** (0.000707)	var(e.log_HLY_M)	
var(e.log_LE)		_cons	0.107*** (0.0143)
_cons	0.000879*** (0.000117)		
N	112		

Table A2: Detailed SEM results for EU-13, 1995-2017
(Source: Own contribution in Stata 16)

Variables	*Test Results*		
	Chi²	*df*	*p-value*
Log_ER_55_64	116.41	7	0.0000
Log_LP	140.12	3	0.0000
Log_BR	0.96	1	0.3283
Log_LE	65.12	1	0.0000
Log_PGPH	180.47	3	0.0000
Log_HLY_F	0.57	1	0.4511
Log_HLY_M	2.67	1	0.1024

Table A3: Wald tests for equations of SEM, EU-13, 1995–2017
(Source: Authors' contribution in Stata 16)

Fit statistic	*Value*
Likelihood ratio	
Model vs. saturated chi^2_ms (67)	942.468
$p > chi^2$	0.000
Baseline vs. saturated chi^2_bs (84)	1276.158
$p > chi^2$	0.000
Population error	
RMSEA (Root mean squared error of approximation)	0.342
90% CI (Confidence Interval), lower bound	0.322
90% CI (Confidence Interval), upper bound	0.361
Pclose (Probability RMSEA <= 0.05)	-0.000
Information criteria	
AIC (Akaike's information criterion)	-250.658
BIC (Bayesian information criterion)	-166.384
Baseline comparison	
CFI (Comparative fit index)	0.266
TLI (Tucker–Lewis index)	0.079
Size of residuals	
SRMR (Standardized root mean squared residual)	5.007
CD (Coefficient of determination)	0.528

Table A4: Goodness-of-fit tests for SEM, 1995–2017, EU-13
(Source: Authors' contribution in Stata 16)

ERP SYSTEMS IN THE CONTEXT OF SMART FACTORIES

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ABSTRACT
Today's industrial development is driven by global competition and demands of an ever-changing market, being thereby exposed to the radical advancement of digital technologies. The 4th industrial revolution has brought opportunities to improve products and services, but it also poses a threat to industrial manufacturers in view of the demands and competition present in the global market. Industrial manufacturers therefore can act successfully only if they adapt their production by introducing these digital technologies into existing manufacturing processes. The combination of digital technologies and virtual-physical systems makes it possible to integrate business and manufacturing processes of all participants in the value chain of the company (suppliers and customers), resulting in the development of smart factories. In addition to the availability of digital technologies, traditional enterprise resource planning (ERP) systems, which support manufacturers work-flow and contain a serious amount of business data, are the foundation for seamless integration of production and business processes with the new technologies. This paper explores recent relevant literature in the field of ERP systems connected with the smart factory's concept and technologies, and gives an overview of main initiatives that can help exploit the most benefits out of their interrelated use. The purpose of the review is to investigate how well ERP systems meet the needs of smart factories, whereby the findings are systemized within a SWOT (strengths, weaknesses, opportunities and threats) analysis. The SWOT analysis gives an overview where the future strategies and activities should be directed to, in order to reduce the impact of negative elements within SWOT and take full advantage of traditional ERP technologies to help organizations transform to smart factories.
Keywords: *enterprise resource planning (ERP) systems, smart factory, digital technologies*

1. INTRODUCTION

The 4th industrial revolution, initiated by the development of digital technologies (or Industry 4.0 technologies), has led to many changes in production and information systems which are driven by new innovative solutions. Technological basis for the change is the smart automation of virtual-physical systems with decentralized control and advanced integration through all possible functionalities of digital technologies. Implications on the industrial manufacturing systems are seen in the reorganization and change of business processes through the integration of digital technologies, machines and existing systems to a self-organizing virtual-physical production systems, which allows flexible mass custom production and flexibility in the pro-

duction volume (Rojko, 2017). Digital technologies can be used individually or combined with each other for development of new products (like smartphones), new services (like smart cities) or complete rounded solutions (such as smart factories). National industrial programs of many countries highlight key development strategies such as:

- implementation of Industry 4.0 technologies
- connecting virtual spaces and physical spaces
- development of smart factories with efficient self-management that can meet the diverse requirements of the customers and more (Weng et al, 2019).

The main idea of the manufacturing industries development concept is to exploit the potential of new technologies, to integrate technical processes and business processes in enterprises and perform digital mapping and virtualization of the real world into that of smart factories, including smart industrial assets and smart products (Rojko, 2017). Most production systems base their business on existing information systems, and with the implementation of digital technologies they adapt and accept new ways of doing things digitally, but some sectors (like agriculture for example) are slow in adopting ERP systems and digital technologies. Kirikova (2019) highlighted the most famous conference on information systems and analyzed emerging topics covering the area of Industry 4.0 in line with traditional topics, one of which is certainly enterprise resource planning (ERP). In the future, information systems will serve as the basis for the development of systems of arbitrary combinations such as social, virtual and physical systems. In fact, the information system is often a social, virtual, and physical system that collects, organizes, stores, and distributes information, with each of these subsystems being the receiver, operator, and provider of information (Kirikova, 2019). Embedded systems and global networks, as the two major digital technologies, play a central role in smart factories, with virtual-physical embedded systems interacting with each other and humans in real time via the Internet of Things (Sun, Wu and Chan, 2018). The central idea of Industry 4.0 is to assign "intelligence" to individual production machines and equipment so that they can identify and adjust their own parameters, work in business processes and "collaborate" with related machines to achieve optimization (Weng et al, 2019). It also supports information-centric manufacturing and directs manufacturing companies to gain higher levels of digital capabilities to use the available data efficiently. Unbundling operations by integrating information technology systems along the supply chain will result in improved planning and execution of supply chain activities, made possible by real-time exchange of information (Mantravadi, Moller and Moller Christensen, 2018). With the introduction of Industry 4.0 technologies and the trend of automation and data sharing in manufacturing technologies, a "smart factory" is being created. Virtual-physical systems in production environments (such as manufacturing plants, smart machines, storage systems, etc.) using Industry 4.0 technologies will be able to exchange information on their own, resulting in improved supply chains (Mantravadi, Moller and Moller Christensen, 2018). Information sharing of all supply chain actors is seen as especially important in fresh food production, because of the short shelf life of fresh food products. Data is supposed to be available to all partners with the value chain immediately when it arises, enabling necessary reaction in real time (Mantravadi, Moller and Moller Christensen, 2018).

2. METHODOLOGY

For analysis of the selected research topic a review of published papers available in the relevant scientific, bibliographic database Scopus was made. The search in the mentioned database was performed on the basis of a complex query - “Enterprise resource planning” (ERP) and “smart factory”. The search included all articles that contained the listed words from the query and were found in the abstract, keywords, or title of the articles.

No special search restrictions were selected. All available articles and papers published in conferences and journals were included in the processing, while no time limit was set, given the topic is of recent times. The search resulted in 24 articles, of which 23 were further analyzed. A total of 16 relevant articles was selected for the preparation of this paper. The articles are more recent, ie they were published in the period from 2010 to 2020.

3. ERP AND SMART FACTORY ISSUESMETHODOLOGY

Existing systems in organizations, including resource management systems, are widely used to manage operations and processes of manufacturers. Haddara and Elragal (2015) questioned whether ERPs were prepared to accept factory operations of the future and effectively manage them. In this section, ERP and smart factories are defined, and the existing issues on their connection have been analyzed.

3.1. ERP systems

In the period of the previous industrial revolution, the advancement of production processes was recognized in the automation of industrial processes and interaction with supply chain activities, which was achieved by investing in the automation of production equipment and assembly lines, as well as the use of ERP systems. Initially, ERP was used to report incoming materials and represented the evolution of materials management. After that, ERP management was responsible for the entire production inventory and use the Material Requirements Planning (MRP) calculation as a tool for ordering materials based on the production plan and current inventory levels (Ford, 2016). Today, the 4th Industrial Revolution, changes in the global market and increasingly complex customer requirements have given a clear signal that progress is needed in the manufacturing industry, with an accent on the connection between the equipment and the business system. More detailed than ERP is the Manufacturing Execution System (MES), which includes plant scheduling applications. MES systems often connect directly to control machines and collect information such as status, rate, number of pieces, parameter data, and coordinate with schedules developed by ERPs (Ayvarnam and Mayurappriyan, 2017). Mantravadi et al. (2018) investigated the role of information systems production (outside the ERP layer) to define the role in smart factories to improve "visibility" in the supply chain. According to the vision of Industry 4.0, enterprise integration by collaboration between organizations in the supply chain can achieve a competitive advantage. However, not much research has been done on information systems that allow real-time information exchange between integrated enterprises.

3.2. Smart factories

A smart factory refers to digital technology based manufacturing systems that can improve overall production performance (Yoon et al, 2016) and meet different customer requirements (Weng et al, 2019). Common aspects of smart factories are:

- networked components from which useful data can be collected;
- real-time visualization of production components;
- performance of autonomous and automatic processes based on optimized production plans;
- production of advanced and smart manufacturing services and products (Yoon et al, 2016).

The basic process of a smart factory is the digital conversion from physical into a configured production system. The latest advances in manufacturing system development are renewable production systems, which include a reconfigurable production system with customizable hardware and software components. Machines in smart factories are physical systems integrated with digital components. These are autonomous systems that, in large as well as small organizations (Sun, Wu and Chan, 2018), collect real-time data and make their own

decisions based on machine learning algorithms, analytics results and recorded successful past behaviors, enabling them to keep up with everchanging market demands and produce "smart" products (Rojko, 2017). The smart factory and the way it operates can be explained through and vertical and horizontal integration. The smart factory, at the vertical level, as shown in Fig. 1, can be clarified through four layers: the physical resource layer, the network layer, the cloud layer, and the perception layer (Hrustek and Tomičić Furjan, 2019) and ERP systems can be a data source and connector between all of them.

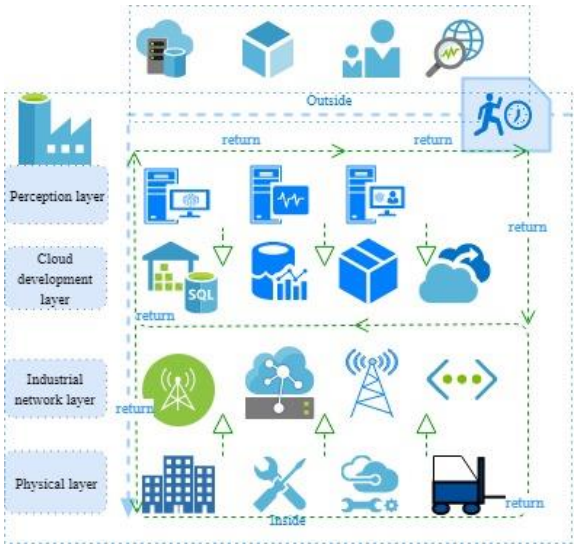

Figure 1: Vertical integration of smart factory (Source: Hrustek and Tomičić Furjan, 2019)

Horizontal integration (by production, industrial automation and IT fields) is a strategy of integrating IT systems (also between different companies) in order to achieve a complete solution (Mantravadi, Moller and Moller Christensen, 2018).

3.3. ERP issues in the context of a smart factory

The problems of traditional information and resource planning systems vary depending on the context in which they are viewed. In the context of smart factory needs, looking at resource planning systems reveals some of operational issues. One of the problems noted is the relationship between the inquiries received and the orders executed. The main reason for this problem is the lack of quick response. Another problem is related to the quantities of parts in stock that may be excessive or insufficient, which affects the planning of the production process (Weng et al, 2019). Given the accelerated development of digital technologies, there is a lack of research exploring the relationship between an ERP systems and the smart factory concept. Current ERP systems face some problems such as their ability to predict situations and interact with machines. Furthermore, ERP systems are not accustomed to making decisions on production itself and the production volumes, but these decisions are made on the basis of employee judgments and subsequently incorporated into the system. ERP readiness for future automation plans was identified as a major problem. Another possible problem related to ERP systems is the inability to have impeccable and unambiguous communication, that is, the lack of relevant information to perform the tasks. The advancement of digital technologies promises to fulfill these needs, including requesting or even executing in real time. This is important but also challenging, as modern manufacturing systems often face changes that can in many cases affect subsystems as well. The consequences require great efforts, the risk of inconsistent data and the loss of important time for quick response and short delivery times.

Achieving these goals requires the most appropriate use of product and production information at the right time at the right point of sale and all related systems in the value chain. A problem is also the social component of the ERP system, namely the reliance on the role of people who enter and maintain data, which creates data quality problems. Humans have inadequate time and imperfect accuracy, which creates the problem of recording information about things in the physical world. Therefore, in the context of smart factories, there is a need to collect digital information and systems that support it (Postelnicu and Martinez Lastra, 2011). The 4th industrial revolution has certainly brought opportunities in terms of improving business processes, products and services through digital technologies, but it also poses a threat to industrial manufacturers in view of the demands and competition present in the global market. Industrial manufacturers should look at the strengths and weaknesses of the current state of business, with assumptions and goals aimed at the pursuit of a smart factory.

4. SWOT ANALYSIS OF ERP SYSTEMS IN THE CONTEXT OF SMART FACTORIES

The analysis of strengths, weaknesses, opportunities and threats (SWOT) (Nyarku and Agyapong, 2011), (Phadermrod, Crowder and Wills, 2011) related to the development of ERP systems was observed with respect to the features of the smart factory concept and they are presented in Fig. 2. The strengths and weaknesses of existing ERP systems have been observed and identified from the perspective of an industrial manufacturer. The opportunities and threats in developing an ERP system relate to the external influence of a number of factors smart factories imply. Strengths of existing ERP systems are mostly seen in the existing data within, which can be used for preventative maintenance and can provide the manufacturer with useful information on the life and reliability of their products (Rojko, 2017). The introduction of service-oriented architecture (SOA) into existing systems can facilitate integration and communication between machines and ERP. The developed integration framework that enables communication between ERP and other objects determines the readiness of the ERP system for a smart factory (Haddara and Elragal, 2015) and the introduction of RFID technology to monitor production execution associated with the ERP system can significantly improve production planning (Mladineo et al, 2019). In addition, establishment of technology-oriented and modern organizational culture, proper mechanisms for knowledge transfer and employee awareness of technology can be a stimulus for the establishment of smart factories of existing organizations (Haddara and Elragal, 2015), and existing knowledge of employees about handling ERP systems can be a good basis for realization of it.

Figure following on the next page

STRENGHTS	WEAKNESSES
➢ great amount of existing data within the ERP system (Rojko, 2017) ➢ service–oriented architectures in existing ERPs (Haddara and Elragal, 2015) ➢ employee's knowledge on how to operate and manage ERP systems (Haddara and Elragal, 2015) ➢ introduction of RFID technology to monitor production execution associated with the ERP system (Mladineo et al, 2019).	➢ difficulties of existing solutions in integration among different organizations (Mantravadi, Moller and Moller Christensen, 2018) ➢ problems in monitoring the conditions of live production and data exchange at the enterprise level (Mantravadi, Moller and Moller Christensen, 2018) ➢ most factories still do not rely on ERP in all processes (Haddara and Elragal, 2015) ➢ introduction of additional modules requires great efforts in programming and integration and hard integration between machines and ERP systems (Haddara and Elragal, 2015) ➢ hard adding new elements and functionalities into ERP systems (Trabesinger et al, 2019) ➢ modular structure of ERP with centralized work and the limited ability to dynamically adapt the production plan (Zeller, Jazdi and Weyrich, 2019)
OPPORTUNITIES	**THREATHS**
➢ development of rapid scheduling algorithms for receiving orders (Weng et al, 2019) ➢ new software IT companies offer (Kirikova, 2019) ➢ capabilities from data (Kirikova, 2019) ➢ integration of operations among organizational IT systems (Mantravadi, Moller and Moller Christensen, 2018) ➢ clever or "lean" software allows accurate data to be collected and predicted (Ford, 2016) ➢ high level of data connectivity and integration (Trabesinger et al, 2019)	➢ great investment of additional resources for adaptations (Kirikova, 2019) ➢ lack of relevant research on ERP system and a smart factory (Haddara and Elragal, 2015) ➢ manufacturing complexity and requirements for customized products and services (Trabesinger et al, 2019) ➢ difficulties of integrating existing standards (Fraile, 2018)

Figure 2: SWOT analysis of ERP in the context of smart factories

The analysis of weaknesses showed that one of them is the addition of new elements and functionalities into ERP systems, as well as their mutual connection (Trabesinger et al, 2019) and difficulties of existing solutions in integration among different organizations (Mantravadi, Moller and Moller Christensen, 2018). There are concern about the integration between machines and ERP systems (Haddara and Elragal, 2015). This problem starts with outdated machines in production lines that do not possess communication tools related to the ERP system, which are the prerequisites for the implementation of a full automated infrastructure (Haddara and Elragal, 2015). Other weaknesses identified are the modular structure of ERP with centralized work and the limited ability to dynamically adapt the production plan (Zeller, Jazdi and Weyrich, 2019), problems in monitoring the conditions of live production and data

exchange at the enterprise level (Mantravadi, Moller and Moller Christensen, 2018), as well as the fact that most ERP systems have production planning modules, however, most factories still do not rely on ERP in this process, and the inventory management process in most warehouses is chaotic (Haddara and Elragal, 2015). The opportunities for developing ERP systems with the use of digital technologies relate to the context of possibilities Industry 4.0. technologies bring, which are integrated into new software IT companies offer (Kirikova, 2019), but also to: the development of rapid scheduling algorithms for receiving orders (Weng et al, 2019), capabilities from data that can be used in information systems (controlled classification into developed centralized databases, data logs, open data capabilities and information available on social networks and similar) (Kirikova, 2019), integration of operations among organizational IT systems (Mantravadi, Moller and Moller Christensen, 2018), clever or "lean" software allows accurate data to be collected and predicted (Ford, 2016), high level of data connectivity and integration (Trabesinger et al, 2019) similar. Market research can contribute to the development of highly innovative solutions that cross the boundaries of reality and are tailored to the needs of industrial manufacturers and the market. Multiple adaptations and development of multiple types of systems which have to be integrated with ERP systems, exploring possibilities of integrating physical devices with virtual components and creating interaction of devices with human beings requires great investment of additional resources (Kirikova, 2019), and is therefore seen as a threat. In addition, financial decision making requires expert analysis and engagement, so additional major investments. Other threats, such as manufacturing complexity and requirements for customized products and services (Trabesinger et al, 2019), difficulties of integrating existing standards that underpin existing business into new concepts (Fraile, 2018) and the lack of relevant research exploring the relationship between an ERP system and a smart factory (Haddara and Elragal, 2015) require additional research and knowledge and can influence the success rate of ERP systems development.

5. ADVANCING ERP SYSTEMS TOWARDS THE CONCEPT OF SMART FACTORY

A key goal of many industrial manufacturers is certainly to realize the rich potential of Industry 4.0 technologies in a fast, secure and flexible way. Business Resource Planning systems (ERP) are considered to be the backbone for Industry 4.0 (Haddara and Elragal, 2015), and in smart factories, they are supposed to be integrated with two other major software applications, namely Product Lifecycle Management (PLM) and Production Management System (MES) (Ayvarnam and Mayurappriyan, 2017), with digital technologies. Manufacturers of ERP systems, like SAP, Siemens (PLM), Oracle, IBM (Asset Management) and INFOR (BAAN) have already developed parts of the intelligent manufacturing support solutions (Wieland et al, 2016). Using digital technologies, industrial manufacturers are able to integrate business, demand and supply chains, enabling them to engage with end customers in a very unique, unprecedented way. Industry 4.0 is based on highly intelligent and connected systems that create a complete digital value chain (Haddara and Elragal, 2015). The literature mainly cites the importance of ERP systems in classical manufacturing systems to achieve smart factory. The application of ERP and digital technologies easily establishes a digital supply chain, but again, problem arise in some industries. This is clearly seen in agricultural production, where it comes to fresh food supply chains, which need further consideration due to critical information such as short shelf life of some food or agricultural products (Mantravadi, Moller and Moller Christensen, 2018). The assumption is that ERP systems can significantly improve the operational efficiency of an agricultural enterprise, but their low adoption rate is caused by many problems, including lack of qualified staff and lack of knowledge about ERP capabilities among top managers and key employees of agricultural enterprises (Kulikov et al, 2020). Decision makers in the agricultural sector face unstable conditions and risks such as physical storage management, control of transportation costs, exposure to climate problems, vulnerability to weeds, pests and diseases

(Haberli, Oliveira and Yanaze, 2017). Experts estimate that, projects related to the agricultural industry account for 1-2% to 10-15% of projects of leading software and hardware manufacturers (Kulikov et al, 2020). Yoon et al. have proposed a smart factory reference bus architecture, that is, an information service bus for a smart factory, which can be used to collect data, analyze and apply it at various stakeholders at the planning levels for machines, factories and businesses (Yoon et al, 2016), (Phadermrod, Crowder and Wills, 2016). Also, a great deal of research highlights the importance of assigning intelligence to machines and integrating machines, equipment, ERP systems, user interfaces and humans (Weng et al, 2019), (Mantravadi, Moller and Moller Christensen, 2018), (Trabesinger et al, 2019), (Fraile, 2018), (Foidl and Felderer, 2016), (Wieland et al, 2016). Some research shows go one step further, and in addition to experimentation with the development, partly designing and integrating the smart factory they are also testing its perfor-mance (Mladineo et al, 2019). When focused on the modeling of socio-virtual-physical systems, it is necessary to single out the Industry 4.0 Model Reference Architecture (RAMI 4.0) as a three-dimensional framework that incorporates hierarchy levels, life cycles, and values and layers, which is also designed to serve smart factories (Rojko, 2017), (Kirikova, 2019). Wisdom Manufacturing has been seen as a synthesis of organizational wisdom, collaborative learning, innovation and creativity, artificial intelligence and the integration of all listed, with the aim of using knowledge to establish and achieve efficient and effective production of custom-tailored, personalized products and services or creation new markets for innovative products (Haddara and Elragal, 2015), which is also the goal of smart factories. Much of the relevant literature looks at and explains MES and ERP as two separate systems in terms of integration with smart factories (Mantravadi, Moller and Moller Christensen, 2018), (Ayvarnam and Mayurappriyan, 2017), (Postelnicu and Martinez Lastra, 2011). The Production Execution System (MES) is tasked with producing the required products using minimal waste in terms of time, cost and energy consumption. Production orders come from the higher level represented by the ERP (Postelnicu and Martinez Lastra, 2011).

6. CONCLUSION

Resource Planning Systems (ERPs) are considered the backbone and foundation for Industry 4.0 technologies implementation. In order to realize the concept of a smart factory, it is necessary to analyze the current state of the industrial manufacturers and the systems they use, in order to improve the use new digital technologies. In this paper, a survey of relevant literature in the field of resource planning (ERP) systems and smart factories has been conducted. The analyzed literature revealed current topics of the concepts of industry 4.0 and smart factories and the issues and the role of ERP in the context of the smart factory concept. Also, based on the literature analysis, the strengths and weaknesses and opportunities and threats of developing an ERP system were identified. Strengths and weaknesses relate to existing ERP systems from industrial manufacturers considered in terms of smart factory. Opportunities and threats to the development of ERP systems have been observed in view of the opportunities and challenges posed by the concepts of Industry 4.0 and smart factories in terms of the development of new digital systems, products and services. Developing new digital systems where processes are timely, real-time data is processed and key decisions are made, then smart products characterized by embedded sensors and other functional components, and quality and seamless digital services that follow the user experience lifecycle are characterizing smart factory in the future. An analysis of the opportunities has shown that ERP can in the future become systems that will be integrated with other systems and equipment through digital technologies, and there is a possibility of upgrading additional functionalities that have been not covered so far. The threats ERP systems face are great spending of resources on considering integration and exploring additional functionality.

The complexity of production systems and the sluggishness of change must also be emphasized. Only when a new production system is planned from scratch, is it possible to design it according to the requirements of the Industry 4.0 concept. Therefore, one of the threats are also standards already in place that have to be integrated into the new concept. Certainly, in the face of traditional ERP and existing production systems, transformation to smart factory is a big challenge. The integration of digital technologies and the adaptation of existing systems requires efforts in terms of resources, which should certainly be viewed at a strategic level, as it requires a long-term view.

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ON THE DETERMINANTS OF THE TUNISIAN ECONOMIC GROWTH RATE: EVIDENCE FROM A MSI-VAR MODEL

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ABSTRACT
In this paper, we employed a two-dimensional Markov-switching vector autoregression model with regime shifts in intercept to study the regime shifts of the Tunisian economic growth rate. Results revealed that the economic growth rate is strongly affected by investment and consumption while trade openness and international financial integration have a little effect. Such results imply that the Tunisian government has to improve economic strategy along with trade and capital openness to promote economic growth.
Keywords: *Multivariate Markov switching, Tunisian economic growth rate, international financial integration*

1. INTRODUCTION

The analysis of economic cycles and fluctuations is of great interest to economic agents. For the decision maker, the objective is to stabilize the macroeconomic environment and for the private agent; it is necessary that operates in business climate favorable to it's inter temporal choices. Dating and detection of cyclical turning points allows policymakers anticipating and knowing the dates of change in the economy and thus taking appropriate economic policies. Studies of economic cycles back to the pioneering works of the National Bureau of Economic Research (NBER) in (1920), Mitchell (1927) and Burns and Mitchell (1946).These authors identified the asymmetrical character and the co-movement among economic series. Linear models that assume symmetry throughout the cycles do not take into account the cyclical turning points. Thus, cyclical fluctuations, which have multiple sources (variability of economic policy, relative price shocks, productivity shock, supply shock, demand shock, etc.) can be studied by nonlinear switching models regimes among which the Markov switching model popularized by Hamilton (1989). This model implies the existence of different regimes where the series acts differently depending on the states of an unobservable transition variable. Among the extensions of Hamilton (1989) model, we find a multivariate generalization of the Hamilton's single equation model: the Markov Switching vector autoregressive (MS-VAR) model developed by Krolzig (1997). In these extended models there is an unobserved state driven by an ergodic Markov process that is common to all series. In a sequence of papers, Krolzig has studied the statistical analysis of the MS-VAR models and their application to dynamic multivariate systems (Krolzig (1998, 2000, 2001), Krolzig *et al* (2002)). In subsequent studies, Clements and Krolzig (2002, 2003) discussed the characterization and the testing of business cycle asymmetries based on MS-VAR model. Pelagatti (2002) estimated a duration dependent MS-VAR model by using a multimove Gibbs sampler since the computational burden in using the ML approach to such models is high. Ehrmann *et al.* (2003) combined both Markov-switching and structural identifying restrictions in a VAR model to analyze the reaction of variables to fundamental disturbances. Over the last decades, developing and emerging economies experienced considerable economic and financial integration in the global economy, especially with the signing of free trade agreements and the abolition of restrictive measures on capital movements. The aim is to stimulate economies and promote economic growth. Among the determinants of economic growth, investment and government spending are the means used by the government to stimulate economic growth.

This leads us to question the impact of government policies on economic growth according to the cyclical phases of the economy. Our study attempts to show the asymmetric effects of the various shocks on economic growth conditional on the state of the economy. We analyze the characteristics of the economic growth cycle and the impulse responses functions resulting from estimating a MS-VAR model with regime shifts in intercept. We present implications of such results and economic policy recommendations for the Tunisian government. The paper is organized as follows. Section 2 describes the various specifications of the MS-VAR model and the estimation process via the EM algorithm. Section 3provides the empirical results and analysis. Section 4 concludes.

2. THE MS-VAR MODEL

Since the pioneering work of Sims (1980), the vector autoregression (VAR) model has been widely used in empirical macroeconomics to study the effects of macroeconomic shocks and the response of the economy to these shocks. The assumption subjacent to this model is that the evolution of the economy can be explained by the dynamic behavior of a vector of variables linearly dependent of the past. This model has undergone many extensions, among which the markov switching VAR (MS-VAR) model proposed by Krolzig (1997). This author discusses them in some categories depending on which parameters are allowed to vary across regimes. The change can be in the mean (MSM models), in the intercept (MSI model), in the variance (MSH models), in the mean and variance (MSMH models) and in the intercept and variance (MSIH models). According to Krolzig (1998): "the mean adjusted form and the intercept form of an MS(M)–VAR(p) model are not equivalent. These forms imply different dynamic adjustments of the observed variables after a change in regime. While a permanent regime shift in the mean causes an immediate jump of the observed time series vector onto its new level, the dynamic response to a once-and-for-all regime shift in the intercept term is identical to an equivalent shock in the white noise series". In this work, we suggest using a Markov Switching Intercept VAR model rather than using a Markov Switching Mean VAR model.
The MSI(M)-VAR(p)models, as defined in Krozig (1997), is written as:

$$y_t = \begin{cases} \mu_1 + \phi_1 y_{t-1} + \ldots + \phi_p y_{t-p} + \varepsilon_t \\ \\ \mu_M + \phi_1 y_{t-1} + \ldots + \phi_p y_{t-p} + \varepsilon_t \end{cases} \quad (1)$$

Where $y_t = (y_{1t},\ldots,y_{nt})$ is an *n* dimensional time series vector, $\mu = (\mu_1,\ldots,\mu_M)$ is the vector of intercepts, $\phi_1,\ldots,\phi_p$ are the matrices containing the autoregressive parameters and ε_t is a white noise vector.

In the MS-VAR specifications, it is assumed that the unobserved state s_t follows a first-order Markov-process. The implication is that the current regime s_t depends only on the regime one period ago, s_{t-1}:

$$P\{s_t = j | s_{t-1} = i,\ s_{t-2} = k,\ldots\} = P\{s_t = j | s_{t-1} = i\} = p_{ij} \quad (2)$$

Where p_{ij} gives the probability that the state *i* is followed by the state *j*.

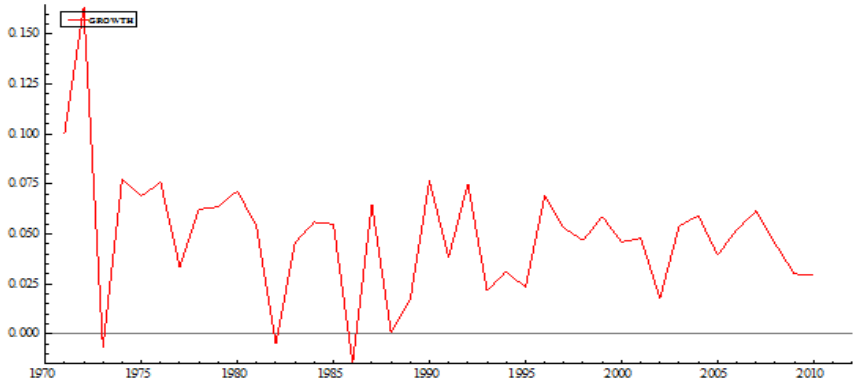
The Hamilton's (1989) algorithm consists of two parts. In the first part, population parameters including the joint probability density of unobserved states are estimated and in the second part,

probabilistic inferences about the unobserved states are made by using a nonlinear filter and smoother. Filtered probabilities $P(s_t = j|\psi_t)$ are inferences about s_t conditional on information up to time t and smoothed probabilities $P(s_t = j|\psi_T)$ are inferences about s_t by using all the information available in the sample for $t = 1,2,\ldots T$. The conventional procedure for estimating the model parameters is to maximize the log-likelihood function and then use these parameters to obtain the filtered and smoothed inferences for the unobserved state variable s_t. However this method becomes disadvantageous as the number of parameters to be estimated increases. Generally in such cases, the Expectation Maximization (EM) algorithm, originally described by Dempster *et al.* (1977) is used. This technique starts with the initial estimates of the hidden data and iteratively produces a new joint distribution that increases the probability of observed data. These two steps are referred to as expectation and maximization steps. The EM algorithm has many desirable properties as stated in Hamilton (1990).

3. EMPIRICAL RESULTS AND ANALYSES

As stated before, our objective is to explore the sources of the Tunisian economic growth rate fluctuations using a multivariate framework. A graphical analysis of the annual Tunisian economic growth rate, proxied by the growth rate of the real GDP, shows that Tunisia has experienced fluctuating economic growth between 1971 and 2010[1]. The summary statistics table shows that the average economic growth rate over the period 1971-2010 is 4.9%. The maximum is reached in 1972 and was 16.33% while the minimum of the series was recorded in 1986 and was about -1.45%. As indicated by the standard deviation, the series experiencing high variability over the period (3.14%).

Figure 1: Annual Tunisian economic growth rate



3.1. Dataset and preliminary treatment

The data used for our purpose consist on the annual real GDP (RGDP), the general government final consumption expenditure (GC), the gross capital formation (INV), the trade openness (OPEN) and the international financial integration (IFI) from 1970-2010.[2] As measure of economic policy, we consider the budgetary and the investment policy. Budgetary policy is one of the main levers of the economic policy. This policy consists on using budgetary instruments which are public expenditure, public debt and taxation in order to influence economic conditions. Investment is also a key determinant of economic growth in the long term. In fact any investment made by the country in infrastructure, new technology or other is a necessary condition for the attraction of capital flows and foreign investment.

[1] Author's calculation.
[2] Sources of variables are given in the table 2.

As such, the infrastructure that exists in a country affects the cost of doing business and, therefore, it may affect business decisions to settle in this country. In this study, we consider the gross capital formation as a proxy for the gross domestic investment which consists of outlays on additions to the fixed assets of the economy plus net changes in the level of inventories (WDI, 2013). Given that Tunisia is a small open economy for witch trade and capital openness could be an important vehicle for economic growth, we consider a trade openness indicator approximated by the sum of imports and exports of goods and services (current US$). As a measure of the degree of international financial integration, we consider the updated and extended version of dataset constructed by Lane and Milesi-Ferretti (2007). These authors have broken foreign assets and liabilities for a large sample of countries for the period 1970-2011 into four types: foreign direct investment, portfolio investment, debt and derivatives and official reserves.[3]We prefer these quantities based on de facto measures rather than de jure measures as the latter do not reflect the degree of enforcement of capital controls and therefore the actual degree of financial integration in the world financial markets. So we consider as a degree of international financial integration the sum of inflows and outflows of capital, expressed in current U.S. dollars.

3.2. Preliminary tests

In the preliminary tests, we are going to verify the stationary of the time series, the Garnger-causality and we finished by the linear test in order to check the appropriate model. To properly specify the MS-VAR model, we check the stationary of each variable in our sample at 10% significance level. The Augmented Dickey–Fuller (ADF) test has a unit root as the null hypothesis and has stationary as alternative hypothesis. We reject the null hypothesis of non stationary if the statistical value is greater than the ADF critical value. ADF test results show that all variables are not stationary in levels. In log difference, the variables are stationary at 10% significance level.[4] The log difference of the real GDP gives the economic growth rate such as:

$$Growth = \ln RGDP_t - \ln RGDP_{t-1}$$

The log difference of GC, INV, OPEN and IFI provides the change between two subsequent years of these variables.[5] To determine the autoregressive orders of the model, we use the Akaike Information Criterion (AIC). Lag 2 is appropriate for our MS-VAR model. That is, we estimate a two regimes Markov Switching Intercept Vector Autoregression model with lag 2, MSI(2)-VAR(2). A common method for testing Granger causality is to regress y on its own lagged values and on lagged values of x and tests the null hypothesis that the estimated coefficients on the lagged values of x are jointly zero. Failure to reject the null hypothesis is equivalent to failing to reject the hypothesis that x does not cause y.[6]

The equation to be tested is done in the following regression:

$$Growth_t = \alpha_0 + \beta_i \sum_{t=1}^{m} Growth_{t-i} + \gamma_i \sum_{t=1}^{m} GC_{t-i} + \varphi_i \sum_{t=1}^{m} INV_{t-i} + \pi_i \sum_{t=1}^{m} Open_{t-i} + \omega_i \sum_{t=1}^{m} IFI_{t-i} + \varepsilon_t$$

[3]We are grateful to Philip R. Lane and Gian Maria Milesi-Ferretti for providing us with the database on capital flows.
[4]ADF test results of the log differenced variables are reported in appendix.
[5] Descriptive statistics of the log differenced variables are presented in appendix.
[6] Source : STATA manual

To test the non-Granger causality from GC, INV, Open and IFI to Growth, we test the nullity of all coefficients $\gamma_i, \varphi_i, \pi_i, and\ \omega_i$. To this end, we employ a *Fisher* test based on the statistic, S_1:

$$S_1 = \frac{(RSS_0 - RSS_1)}{RSS_1} \frac{(T-2p-1)}{p} \sim F(p, T-2p-1)$$

However, this test is not an accurate due to the existence of endogenous delayed variables in the OLS regression. That is, the *Fisher* test is replaced by an asymptotic $\chi^2(p)$ test based on the statistic, S_2:

$$S_2 = \frac{(RSS_0 - RSS_1)}{RSS_1} \mathrm{T} \sim \chi^2(p)$$

The results of pairwise Granger Causality Tests are given in table1.

Table 1: Pairwise Granger Causality Tests

Null Hypothesis	Chi2	Df	Probability
GROWTH does not Granger Cause GC	6.0109	2	0.050
GC does not Granger Cause GROWTH	1.561	2	0.458
GROWTH does not Granger Cause INV	8.8645	2	0.012
INV does not Granger Cause GROWTH	3.9634	2	0.138
GROWTH does not Granger Cause OPEN	1.9549	2	0.376
OPEN does not Granger Cause GROWTH	0.01772	2	0.991
GROWTH does not Granger Cause IFI	6.176	2	0.046
IFI does not Granger Cause GROWTH	2.1791	2	0.336

At 10% significance level, test results suggest that we cannot reject the null hypothesis that GC, INV, OPEN and IFI does not Granger Cause GROWTH. We accept also the hypothesis that GROWTH does not Granger cause OPEN. On other hand, the results suggest that GROWTH granger cause GC, INV and IFI. Also, results show that there is no feedback between all variables included in the regression. To test the quality of MS-VAR model against a linear VAR model, the likelihood ratio (LR) test is applied, which is asymptotically $X^2_{(r)}$ distributed. However, this test requires normal conditions that are not verified in this case due to the existence of unidentified nuisance parameters under the null hypothesis. Therefore, using a $X^2_{(r)}$ distribution will cause a bias of the estimate. Thus, to circumvent this problem, the LR test statistic is compared to the $X^2_{(r+n)}$ tabulated statistics where n is the number of nuisance parameters. In our estimation, the LR statistic is 21.4489 while the $X^2_{(7)}$=0.0032 so the MS-VAR model is more appropriate than the VAR one's.

4. EMPIRICAL FINDING AND INTERPRETATIONS

The main parameters estimated of the MSI(2)-VAR(2) model are presented in table 3. The results show that the asymmetry of the economic growth rate cycle is well characterized by the properties of the regimes and the transition probability matrix. From the table 3, we show that the Tunisian economic growth rate is characterized by two states. The first regime $(s_t = 1)$ represents the recession state while the second $(s_t = 2)$ represents the expansion one.

The constant associated to the GROWTH equation is about 0.062 if the first regime holds and 0.0927 if the second state is prevailing. Economic growth rate at $t-1$ and $t-2$ negatively affects the GROWTH variable (about -0.671 and -0.074 respectively). The GC and the INV variables positively affect the GROWTH one at $t-1$ and $t-2$. The coefficients associated to OPEN and IFI are negative at the period $t-1$ and $t-2$. The negative effect is more important at period $t-1$ than $t-2$ for both variables. An expansionary policy has a positive effect on economic growth but trade openness and international financial integration are decreasing the economic growth. Through the transition matrix, we find that the transition probabilities from one state to another are different from zero. The probability of remaining in a recession state is 74% against a probability of 66% to remain in a state of expansion. Therefore, the probability of moving from a state of recession to a state of expansion is lower than that the probability of moving from a state of expansion to a state of recession (respectively 26% and 34%). Regime properties show that the first regime is observed 21 times with a probability of 57% while the second regime is observed 17 times with a probability of 43%. The duration of a state of recession is more important than the duration of the second regime, respectively 3.85 and 2.94. Correlation matrix shows a negative linear relation between the economic growth rate and all variables. The correlation coefficient is about -0.2558 between GROWTH and GC. It is less important between GROWTH and INV, OPEN and IFI, respectively of about -0.0342, -0.0731 and -0.1173. Figure 2 shows the filtered, smoothed and predicted probabilities to being in different state. As indicated by the intercept coefficients of the estimated model, the state 1 corresponds to a recession period while the state 2 corresponds to an expansion period. The results show that the recession period has dominated regime for about 20 periods against 16 periods for the expansionist one. The impulses response functions responses of growth to different shocks are given in Figure 3. A unit shock to growth has a deceasing positive effect on growth at the first year where the response is about -0.4. This effect is decreasing and tends to be stable over all periods. Such result is not surprising because Tunisia was marked for long run year by recessive and persistent state. Similarly, shocks on trade openness and international financial integration are negatively affecting GROWTH for all periods. The negative effect is more important for OPEN than IFI. To the contrary, the impulse response functions show that GC and INV shocks affect positively economic growth. Positive changes in the GC and INV increase economic growth at all the time horizon.

5. SUMMARY AND CONCLUDING REMARKS

The results for Granger Causality test suggested that there is no feedback effect between GROWTH, GC INV, OPEN and IFI. There is a unidirectional effect from GROWTH to GC, INV and IFI. Correlation matrix shows the existence of a negative relationship between all the variable of the model. From the Linearity test and the adjustment model presented in the figure 4, we show the adequacy of the MSI-VAR model to explain the Tunisian economic growth rate fluctuations. Empirical finding show Tunisia was marked for the most time by recessionary period where the recession regime is more persistent than the expansionary one. The probability of moving from a recession state to an expansion one is less important than moving from an expansion state to recession one. Results obtained from the impulse responses functions support the hypothesis of a positive relationship between economic growth and general consumption and growth and investment. However, these impulses functions show the negative effect of trade openness and international financial integration on growth. From our results, we conclude that the economic policies are the main driver of the economic growth in Tunisia. The government has to improve economic strategy along with trade and capital openness measures to promote economic growth.

Figure 2: The MSI-VAR model

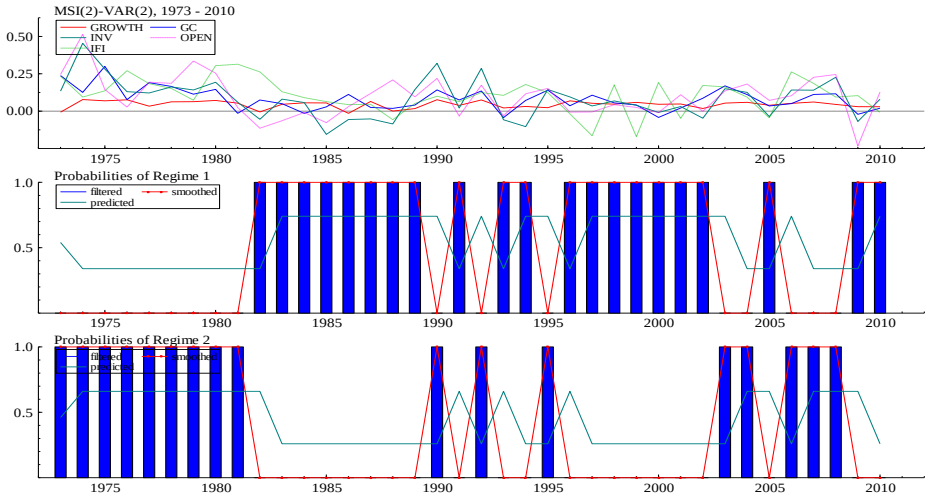


Figure 3: The MSI-VAR model: The Cumulated response functions

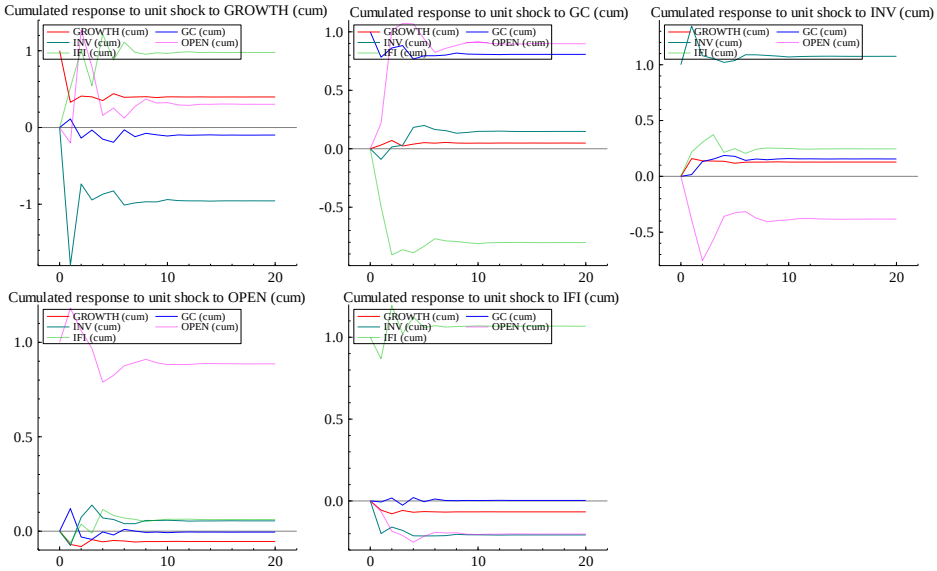


Figure 4: The MS-VAR adjustment model

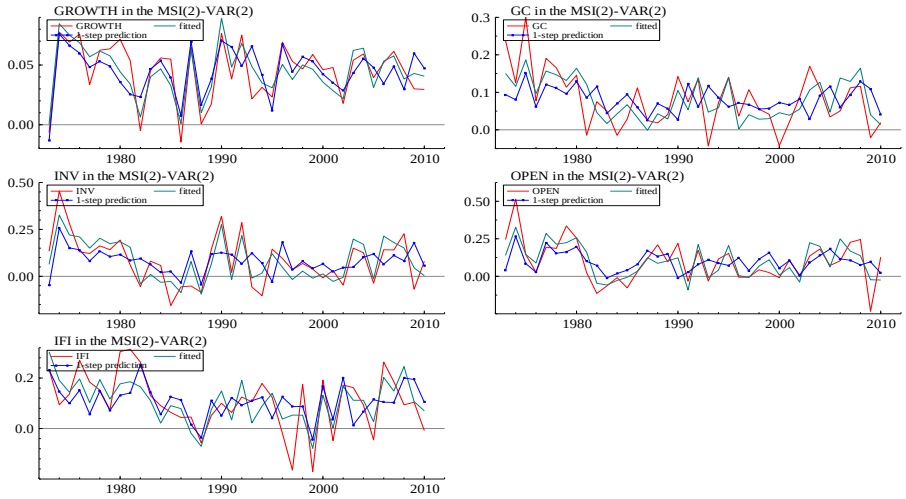


Table 2: The data base

Variable	Source
GDP (constant 2005 US$)	World Development Indicators (2013)
General government final consumption expenditure (% of GDP)	World Development Indicators (2013)
Gross capital formation (% of GDP)	World Development Indicators (2013)
Imports of goods and services (% of GDP)	World Development Indicators (2013)
Exports of goods and services (% of GDP)	World Development Indicators (2013)
GDP (current US$)	World Development Indicators (2013)
Portfolio equity assets (stock), Portfolio equity liabilities (stock), FDI assets (stock), FDI liabilities (stock), (current US$)	Lane and Milesi-Ferretti database (2011)[7]

Table 3: The MSI(2)-VAR(2) estimation results

Parameters	GROWTH	GC	INV	OPEN	IFI
μ_1	0.0672	0.037	0.052	-0.008	-0.010
	(9.255)	(1.258)	(1.334)	(-0.175)	(-0.225)
μ_2	0.0927	0.142	0.254	0.171	0.122
	(10.243)	(3.853)	(5.228)	(2.871)	(2.193)
GROWTH_1	-0.671	0.112	-1.793	-0.202	0.521
	(-7.195)	(0.295)	(-3.576)	(-0.328)	(0.907)
GROWTH_2	-0.074	-0.094	0.575	0.679	1.344
	(-0.711)	(-0.223)	(1.035)	(0.995)	(2.109)
GC_1	0.032	-0.217	-0.091	0.218	-0.494
	(0.709)	(-1.197)	(-0.380)	(0.740)	(-1.798)
GC_2	0.069	-0.0004	0.0936	0.74	-0.569
	(1.740)	(-0.002)	(0.439)	(2.831)	(-2.333)
INV_1	0.159	0.015	0.347	-0.39	0.218
	(4.672)	(0.115)	(1.898)	(-1.736)	(1.041)
INV_2	0.016	0.145	-0.086	-0.116	-0.058
	(0.454)	(0.970)	(-0.437)	(-0.479)	(-0.257)
OPEN_1	-0.070	0.119	-0.075	0.18	-0.061
	(-2.594)	(1.088)	(-0.521)	(1.008)	(-0.366)
OPEN_2	-0.041	-0.137	0.062	-0.223	0.213
	(-1.484)	(-1.230)	(0.418)	(-1.233)	(1.258)
IFI_1	-0.056	-0.006	-0.198	-0.063	-0.132
	(-2.635)	(-0.073)	(-1.743)	(-0.455)	(-1.011)
IFI_2	-0.04	0.0389	-0.023	-0.205	0.375
	(-1.966)	(0.470)	(-0.215)	(-1.525)	(2.986)
σ^2	0.012606	0.051229	0.067769	0.083221	0.077687
p_{11}	0.7404				
p_{22}	0.6603				
AIC	-11.6072				
LR	21.4489 Chi(5) =[0.0007] ** Chi(7)=[0.0032] ** DAVIES=[0.0131] *				
Loglikelihood	297.5373				
(…): T-student.					
[…]: p-value.					

---------- matrix of transition probabilities ------

	Regime 1	Regime 2
Regime 1	0.7404	0.2596
Regime 2	0.3397	0.6603

---------- regime properties ----------

	nObs	Prob.	Duration
Regime 1	21.0	0.5669	3.85
Regime 2	17.0	0.4331	2.94

[7]This database updates and extend "The External Wealth of Nations Mark II" database, Journal of International Economics, November 2007). It contains data for the period 1970-2010 for 184 countries.

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CYBERCRIME AND PROTECTION OF BUSINESS INFORMATION IN TOURISM INDUSTRY- CROATIAN PERSPECTIVE

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ABSTRACT

This paper investigates the effects of cybercrime security threats on business entities in tourism in Croatia in terms of safety of business information. Cybercrime is a real threat to business processes in general, and since Croatia is a country where tourism accounts for 20% of GDP and there are no exact statistics about the impact of cybercrime on business information on tourism in Croatia, it was important to research this topic. The paper shows that computer crime has risen trend while at the same time the number of other crimes in Croatia declines; In the period of five years, computer crime trend in Croatia has doubled (from 1,63% in 2015 to 3,49% in 2019); at the same time when we compare 2019 to 2018, numbers show that cyber crimes in Croatia increased by 87,3 per cent. Results of a conducted survey on a sample of five and four star hotels and five and four star campsites in Croatia show that managers of business entities in tourism know where to look for reliable information in order to make a good and quality decision on reasonable cybercrime protection of business information, as well as that managers of business entities in tourism are sufficiently informed about security procedures when using the Internet, laptops, office phone and e-mail system in terms of a reasonable cybercrime protection of business information. Surprisingly, the research also showed that there is a discrepancy between the willingness of managers to protect business data from cyber attacks and the relevance of business entities' documents that prescribe it. Limitations of research are manifested in sample size, relatively short research period and focus on certain destinations.

Keywords: *business information, Croatia, cybercrime, tourism*

1. INTRODUCTION

Although it seems obvious that security threats affect tourism, security researches suggest that tourists prefer to travel to countries with similar levels of safety and security as exist in their origin country (Foury et al, 2020; 2017). It could be therefore expected that tourists also expect the level of security of their personal data to be at the same level when they are involved in tourism activities. On the other side, organisations are aware of the threats to information systems security, in particular cyber attacks (Choo, 2011; 727-728) and the infringement of confidential data (Shabtai et al, 2012; 39-46). Security of the business information in tourism in general, Croatia included, has not been thoroughly investigated and it is mostly difficult to isolate the data from the general data compression (both on cybercrime and on the security of business information in general). All of the previous researches have been significantly focused on the technical controls of information security (Venter et al., 2003., Cavusoglu et al., 2009), and it is often argued that, as opposed from today, early information systems' security studies approach perceptions of security from a technology acceptance angle (Hu et al., 2007). However, experts growingly argue that the main cause of information security incidents lies mainly with employees' behavioural factors rather than technical issues per se, which implies a turn to internal problems attributed to the users of information systems (Dhillon et al, 2000,

Straub et al., 1998). Employees from organizations with better information security culture were more likely to have knowledge, attitudes, and behaviors in accordance with information security policy and procedures (Parsons, 2015;125). A practical approach to the study information security in organisations is particularly timely and responds to calls for the examination of the micro-practices and everyday routines of strategy formation (Chia, 2004). Employees are a key data security factor, but a dissatisfied employee base provides a vector for insider security events. The inadvertent leakage of information through removable devices or internet connections can make any employee the origination point for serious information security violations (Choi et al, 2018; 758). Croatia is a country where tourism forms the main economic branch in which there is a large number of business data that could become the subject of cyber criminals' interests. In 2019, the commercial accommodation facilities accounted for 19.6 million arrivals and 91.2 million bed-nights of tourists. As compared to 2018, there was a 4.8% increase in tourist arrivals and 1.8% increase in overnight stays (Croatian Institute of Statistics, 2020). This paper introduces an overview of the experience of cyber threats in tourism in general, then analyses the state of computer crime and cybercrime trends in Croatia, and finally analysis data from the research about security threats on business entities in tourism in Croatia in terms of safety of business information.

2. CYBERCRIME – NEW CHALLENGE FOR TOURISM

Cyber security is a new challenge for the tourism economy and business processes in tourism and it recognizes following kinds of cyber threats (Maguilo, 2016: 129):

- Cybercrime: all malicious activities with criminal intent carried out in cyberspace, such as internet fraud, identity theft and data or intellectual property theft;
- Cyber espionage: inappropriate data collection, but not commercial value;
- Cyber terrorism: exploiting the vulnerability of systems with political goals;
- Cyber warfare: actions performed for the purpose of gaining a military advantage

The focus of this research was on cybercrime, and the results of the research were summarized in the Cyber Security Readiness Index designed to measure the capacity and readiness of an organization to combat cyber threats. According to the Sapienza Center in Italy (Maguilo, 2016: 130), cyber security depends on four main elements measured in certain indices. These four elements are:

- The ‘Awareness Index’ - the situational awareness associated with the cyber risks an organization faces (e.g. if the company regularly registers anomalies or if it knows the security policies adopted by suppliers);
- The ‘Defense Index’ - organization’s ability to protect itself from cyber-attacks (restricting the use of personal e-mails, banning the use of personal electronic equipment: laptop, smartphone, and tablet);
- The 'Policy Index' - the implementation of security-related policies (the use of operator security plans or equivalent actions as defined by Council Directive 2008/114 / EC on 8 December 2008).
- The ‘External Independence Index’ - the connectivity of internal systems and external service providers.

Research by the University of Rome (Saplenza as cited in Maguilo, 2016: 131) has shown that the awareness declared by employees is relatively high. Namely, to the question "Do you have a situational awareness of the state of cyber threats to your organization?" - in the industry the response was 80%, in finance 67%, in utilities 75% and in the public sector 54%.

However, sometimes there is a gap between real and perceived consciousness. The research (Maguilo, 2016: 133-134) as a whole showed the following:

- The destination, which is a real tourist product, offers a variety of goods and services mainly exposed to cyber threats. It is no longer enough to protect tourists from physical attacks;
- The cyber threat spreads to the entire economy, including the tourism sector;
- Cyber threats can only be addressed by a new and better company policy based on greater awareness of all stakeholders.

The results of a complementary study entitled "Cyber Security Application in the Modern Tourism Industry" (Bazazo et al., 2019: 46-47) indicated the following:

- The need for all travel companies to provide a complete record of cyber risk, and ensure its updating in a sustainable way to identify all cyber risks and their chronological characteristics, order and categorization of cyber-attack levels,
- The need for tourism and hotel institutions, especially small and medium-sized enterprises, to associate and contract with international companies specializing in the fight against cyber-attacks.

The research results (Bazazo et al., 2019: 51-52) also showed:

- The need for tourism and hotel institutions to develop regulations, principles and internal policies for employees, regarding the security of Internet users and the use of networks and databases, empowering employees through sustainable courses to upgrade their knowledge and skills,
- The need that includes the protection of systems, networks and digital databases in three areas: cybercrime, cyber warfare and cyber terrorism

Likewise, research (Bazazo I. et al., 2019: 52) has shown the importance of a behavioral approach in recognizing problems and the need to increase public knowledge and awareness of the application of cyber security in tourism and hospitality, as well as the need to increase knowledge about decision-making, manage tourist and hotel facilities.

2.1. Cybercrime trends in Croatia

It is important to note that the Croatian Cyber Security Service was first established in 2017 (Official Gazette 129/17) which shows that cybercrime statistics were not kept before 2017 (official statistical data marked as „computer crime" until 2017 is a narrower term than „cybercrime"). Analysed data (2015-2019) from the „Statistical overview of basic safety indicators and work results" of the Ministry of internal affairs of Croatia show that in all observed years the most frequently reported computer criminal offence was computer fraud.

Figure following on the next page

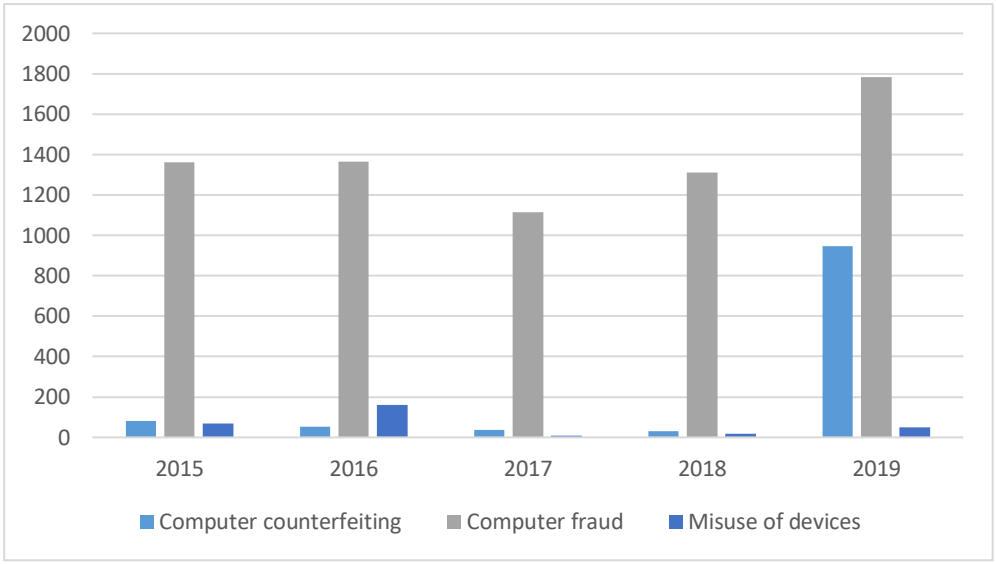

Figure 1: Statistical indicators of reported and resolved individual computer crime offences in Croatia for the period 2015-2019 (Source: authors according to Statistical overview of basic safety indicators and work results in 2015, 2016, 2017,2018 and 2019)

Computer fraud is the most frequent criminal offense in relation to the other criminal offenses. This is confirmed by a number of articles in the specialized journal of Computer Fraud & Security. Thus Richardson (2020; 6-8) emphasizes: "Fraud continues to be a top concern, and dealing with it is a constant battle. However, with the right mix of fraud controls and resources, there is a way to gain the advantage".

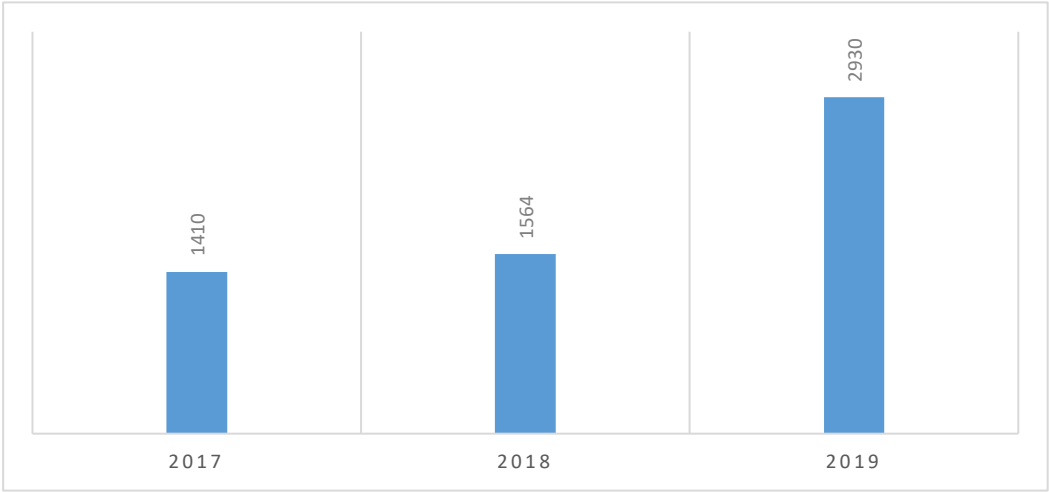

Figure 2: The number of reported and resolved individual cybercrime offences in Croatia for the period 2017-2019 (Source: author according to Statistical overview of basic safety indicators and work results in 2017,2018 and 2019)

All of the above indicates the increase in crime and the increase of the need to secure business systems in general and business systems in tourism entities. This is not possible unless there is a proper perception of the presence of this form of crime, and a developed business and security culture as a prerequisite for prevention.

2.2. Research on protection of business information in Croatian tourism industry

The authors conducted a survey to determine whether (taking into account the growing trend of increasing cybercrime in Croatia) there is a danger for the security of business data with

businesses in tourism. The aim of the research was to gain insight into the perception of the surveyed population (managers of business entities) in the application of appropriate measures to protect business information through two segments within the survey questionnaire. In this context, the research hypotheses were as follows:

- H1 - responsible employees of business entities in tourism know where to look for reliable information in order to make a quality decision regarding the reasonable protection of business information,
- H2 - responsible employees of business entities in tourism are sufficiently informed about security procedures when using the Internet, laptops, office telephone and e-mail system in terms of reasonable protection of business information.

The hypothesis were derived from the assumption that the amount of information in today's information age of globalization is no longer questionable, but the possibility of its rational use has become questionable due to the multiplicity and variety of information; That information cannot be in the hands of privileged persons alone, because the Internet has made it generally accessible, therefore, it must be distributed vertically and horizontally through business processes, and that a certain amount of business information (especially sensitive information that invades personality and privacy) needs to be protected from unauthorized disclosure.

2.2.1. Research methodology

Data were collected by sending an online survey to the e-mail addresses of business entities in tourism (five and four star hotels and campsites) which they filled out in the period from 14 November to 14 December 2019. In order to ensure anonymity of the respondent, the survey was sent to the management e-mails with the request that the survey meets the management levels responsible for data management, ensuring the ethical importance of privacy and confidentiality in the survey. Respondents were not asked for basic social - demographic data because the focus was on business processes, taking into account that they are senior management staff who have reliable information on the issues being surveyed. The respondents were informed on what the research was about and its purpose. Through the first segment of the questionnaire, respondents were asked about their experiences and/or knowledge regarding information quality, access to information, availability of relevant information, compromising business information, investing in business information secure and incidents (theft or attempted theft of business information) in order to test hypothesis H1. The second segment of the survey questionnaire examined attitudes about individual statements related to personal opinion, whether there are normative acts of security and how familiar they are with the same and security procedures, whether there are special procedures on: Internet, laptops, office phone and e-mail, special service for the protection of business information and specific rules for the storage of business information in order to confirm or reject hypothesis H2. The method of analysis and synthesis, binominal distribution and T - test were used, as well as the deductive method of testing through an online survey sent to the e-mail addresses in a total of 75 five and four star hotels in Zagreb, Split, Pula, Rovinj and Dubrovnik and a total of 30 five and four star campsites in the same area. The sample (a certain number of units - 5 and 4 star hotels) was selected in such a way as to be representative in relation to a larger group of 5 and 4 star hotels in order to assess the results in the population as accurately as possible. Of the total number of respondents 7 of them refused to participate in the research on the grounds that it was confidential business information. 21 hotels and 9 campsites (40% of the surveyed hotels and 30% of the surveyed campsites) submitted data for the requested survey.

2.2.2. Research results

Pooled research results are presented in Table 1 and Table 2.

Survey questions	**YES**	**NO**	**I'M NOT SURE**
In the absence of quality information on our hotel, we make the wrong decisions?	13	2	6
If you need to find the one information you urgently need in a multitude of information, can you get proper help from your company?	18	2	1
Are you aware that your company has not endangered business information?	15	3	3
Your company is investing enough money to ensure the safety of business information?	11	4	6
Is there a Regulation on the security of computer information systems in your company and the information stored in it?	9	8	4
If you have answered the previous question affirmatively, do you know if most employees are familiar with the said ordinance?	9	9	3
There is a procedure in your company for internet, laptop, official phone and e-mail use?	11	8	2
Is there a special service in your company dealing with the protection of business information?	11	8	2
Do you think that at this moment your competition would like to have some confidential information about your company?	14	3	4
Total	**111**	**47**	**31**

Table 1: Research results for hotels - number of interviewed 5 and 4 stars hotels: m=21 (Source: authors)

Survey questions	**YES**	**No**	**I'M NOT SURE**
In the absence of quality information at our campsite we make the wrong decisions?	5	2	2
If you need to find the one information you urgently need in a multitude of information, can you get proper help from your company?	8	1	0
Are you aware that your company has not endangered business information?	6	2	1
Your company is investing enough money to ensure the safety of business information?	5	1	3
Is there a Regulation on the security of computer information systems in your company and the information stored in it?	4	3	2
If you have answered the previous question affirmatively, do you know if most employees familiar with the said ordinance?	4	4	1
There is a procedure in your company for internet, laptop, official phone and e-mail use?	5	4	0
Is there a special service in your company dealing with the protection of business information?	5	4	0
Do you think that at this moment your competition would like to have some confidential information about your company?	6	1	2
Total	**48**	**22**	**11**

Table 2: Campsites survey results - number of interviewed 5 and 4 stars campsites: m=21 (Source:authors)

Based on the results presented in Tables 2 and 3, it can be observed that the total number of secure responses was 228 (responses "YES" and "NO"), and the total number of responses "not sure" was 42. Since this is a binary probability distribution (http://www.phy.pmf.unizg.hr/ - July 02th 2020), then the following correlation applies:

b(x;n,p)=(n¦x) p^x q^(n-x)…….……. (1)

where:
p – the probability of an event "I'm sure" ("YES" or "NO")
q=1-p – probability of an event "I'm not sure"
The expected value E (X) and variance V (X) are:
E(X)=np ……..……...(2.1)
V(X)=npq ……..(2.2)

Following the values shown in Tables 2 and 3, the following applies:

Hotels p=158/(158+31)=0,841
q=1-p=0,159

The expected value and variance are: E(X)=np=9·0,841=7,569
V(X)=npq=9·0,841·0,159=1,2

Campsites p=70/(70+11)=0,864
q=1-p=0,136

The expected value and variance are:E(X)=np=9·0,864=7,76
V(X)=npq=9·0,864·0,136=1,05

Following the above results, the question arises whether the number of answers "I am sure" equal to or is less than $\mu = 8$, and what is the level of significance (α) of such a decision? For this purpose, a statistical test was used in which the variance is not previously known, but has been calculated (https://web.math.pmf.unizg.hr/ - July 02nd 2020), so we use T statistics as follows:

$T=(E(X)-\mu)/\sqrt{((V(X))/m)}$ ……(3)

We make the following assumptions (auxiliary hypotheses): Hp0 : $E(X) = \mu$ / Hp1 : $E(X) < \mu$

We reject the assumption (hypothesis) of Hp0 if:

$T<-t_{\alpha}(m-1)$ ……...…….(4)

Pursuant to (3), the following applies:
Hotels
$T=(E(X)-\mu)/\sqrt{((V(X))/m)}= (7,569-8)/\sqrt{(1,2/21)}=-0,431/0,239= -1,8$ ……..(5.1)

Campsites
$T=(E(X)-\mu)/\sqrt{((V(X))/m)}= (7,76-8)/\sqrt{(1,05/9)}=-0,24/0,341=-0,7$ …….. (5.2)

In accordance with the tables for t – distribution and significance level α = 0.05 values for tα amounts (https://ldap.zvu.hr/ - July 02nd 2020):

Hotels t_0.05 (20)=2,09
Campsites t_0.05 (8)=2,31

Therefore, starting from (4), the following applies:
Hotels -1,8>-2,09
Campsites -0,7>-2,31

Consequently, the auxiliary hypothesis Hp0 cannot be rejected, which means that the sample indicates that the expected number of responses "I am sure" in the general population is 8 out of possible 9, with a level of significance (signia) of α = 0.05. The same is considered an acceptable level for verification of the main hypotheses.

2.2.3. Verification of main hypotheses

The main hypotheses will be verified on the basis of the "I'm sure" answer ("YES" or "NO"). Since there is no significant difference between statistical data for hotels and camps, aggregate statistics will be used on a sample of 30 surveyed subjects. Verification of main hypotheses H1 and H2 is divided into two segments as shown in Tables 3. and 4.

Survey questions	**YES**	**NO**
1. In the absence of quality information on our hotel, we make the wrong decisions?	18	4
2. If you need to find the one information you urgently need in a multitude of information, can you get proper help from your company?	26	3
3. Are you aware that your company has not endangered business information?	21	5
4. Do you think that at this moment your competition would like to have some confidential information about your company?	20	4
5. Your company is investing enough money to ensure the safety of business information?	16	5
Total:	**101**	**21**

Table 3: Test results for verification of the main hypothesis H1 (Source:authors)

Following the values shown in Table 3 the following applies:
p=101/(101+21)=0,8278
q=1-p=0,1722

The expected value E (X) and variance V (X) are:
E(X)=np=5·0,8278=4,14
V(X)=npq=5·0,8278·0,1722=0,7127

In this case, both the statistical test and T statistics will be used to test the main hypotheses to determine whether the expected value is greater than μ = 5. We make the following assumptions (main hypotheses H1): H_1^0:E(X)=μ
H_1^1:E(X)<μ

Pursuant to (3), the following applies:

$T=(E(X)-\mu)/\sqrt{((V(X))/m)}=(4,14-5)/\sqrt{(0,7127/5)}=-0,86/0,377=-2,281$ …..…….(6)

In accordance with the tables for t – distribution and materiality level $\alpha = 0,05$ values for tα amount: t_0.05 (4)=2,78

Pursuant to (4), the following applies: -2,281>-2,78

Consequently, hypothesis H10 cannot be rejected, which means that the sample indicates that the expected number of responses "YES" in the general population is 5 out of possible 5, with a significance level (signia) of $\alpha = 0.05$. Hypothesis is fully adopted.

Survey Questions	**YES**	**NO**
Is there a Regulation on the security of computer information systems in your company and the information stored in it?	13	11
If you have answered the question affirmatively, do you know if most employees familiar with the said ordinance?	13	13
There is a procedure in your company for use: internet, laptops, use of an office phone, e-mail?	16	12
Is there a special service in your company dealing with the protection of business information?	16	12
Total:	**58**	**48**

Table 4: Test results for verification of the main hypothesis H2 (Source:authors)

According to the values shown in Table 4 the following applies:

p=58/(58+48)=0,547, q=1-p=0,453.

The expected value E (X) and variance V (X) are:

E(X)=np=4·0,547=2,1 V(X)=npq=4·0,547·0,453=0,99

Equal to the previous case, a statistical test and T statistics were used here to test the main hypotheses to determine if the expected value is greater than $\mu = 3$. We make the following assumptions (main hypotheses H2): $H_2^0:E(X)=\mu$

$H_2^1:E(X)<\mu$

Pursuant to (3), the following applies:

$T=(E(X)-\mu)/\sqrt{((V(X))/m)}=(2,1-3)/\sqrt{(0,99/4)}=-0,9/0,4975=-1,08$ …… (7)

In accordance with the tables for t – distribution and materiality level $\alpha = 0,05$ values for tα amount: t_0.05 (3)=3,18

Pursuant to (4), the following applies: -1,08>-3,18

Consequently, hypothesis H10 cannot be rejected, which means that the sample indicates that the expected number of responses "YES" in the general population is 3 out of possible 4, with a significance level (signia) of $\alpha = 0.05$. Hypothesis is partially adopted.

2.2.4. Research limitations

Research limitations are reflected primarily in the size of the sample, available financial resources, relatively short research time, focusing on certain destinations, as well as the time when the research can affect the results. The implementation of further research will certainly be necessary, because it is an insufficiently explored problem, a growing threat and because there is a need for greater awareness of both business entities in the tourism industry and persons responsible (including at the level of personal safety), of the growing challenge of cybercrime and its impact on the business process in tourism.

3. CONCLUSION

The field of information security has increasingly acknowledged the importance of studying the human issues as well as technical elements of information security (Parsons, 2015; 127). This paper highlights some of the complex issues that can influence human behavior and the complicated relationships between these variables, and it also demonstrates that further research is required to adequately understand the human factors of information security in tourism and information security decision making. The scientific contribution of the paper is evident from the fact that the results from our analysis could be useful for public and private sector initiatives in measuring the risk of business information security in tourism, especially in tourist countries like Croatia. The conducted research has shown that the hypothesis H1 is completely adopted - responsible employees of business entities in tourism know where to look for reliable information in order to make a quality decision on the reasonable protection of business information, while H2 hypothesis are partially adopted - responsible employees of business entities in tourism are only partially sufficiently informed about security procedures when using the Internet, laptops, office phone and e-mail system in terms of reasonable protection of business data (in testing hypothesis H2 a discrepancy between the willingness of managers to protect business data from cyber attacks and the relevance of business entities' documents that prescribe it is noticeable). One limitation of our research is data availability while the sample size is considerably reduced when cybercrime variables are included in the analysis. To conclude, it is important to use behavioral approach in recognizing problems and the need to increase public knowledge and awareness of the application of cyber security in tourism and hospitality, as well as the need to increase knowledge about decision-making, manage tourist and hotel facilities. In terms of future research, the recommendation was to identify different cyber security tools and techniques, which could be of interest to tourism, especially those related to cyber risk insurance in airlines, catering and tourism offices. Therefore, the development and encouragement of scientists in research in the field of malware analysis, digital evidence analysis, and in the field of protection and security of tourist database systems in the field of artificial intelligence and the Internet are encouraged.

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THE RELATIONSHIP BETWEEN UNIVERSITY-INDUSTRY CO-PUBLICATION OUTPUTS

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ABSTRACT

The response of universities to the regional needs has been most explicitly developed in the area of research and innovation. The growth of public-private research collaboration has created a demand for information for decision making, suggesting a set of different indicators able to describe the current trends and outcomes of university-industry collaboration. University-industry interaction is considered as a multifaceted phenomenon, and in some cases, because of the lack of publicly accessible information, the measurement is impossible. Because of the lack of necessary data describing university-industry cooperation and its outputs (number and type of contracts with industrial partners, income from research-development contract, number of licensed technologies, exchange of persons and researchers, involvement of industrial partners in educational programs and trainings…), the aim of the present paper is to partially overcome these problems and analyze university-industry interactions through the co-publication output. To avoid the assumption that the number of joint papers is not a good proxy of university-industry collaboration, we extended our analysis with the type of interaction among different scientific fields (single interdisciplinary or transdisciplinary, based on the OECD categorization). In this sense, our data analysis and data corrected with the interaction among different scientific fields encompass a potential tool to investigate university-industry cooperation outcomes. The chosen approach through Hungarian universities shows that even in the lack of major indicators, the analysis of university-industry co-published papers in the light of interplay between scientific disciplines could be a potential tool suitable to characterize university-industry collaboration.

Keywords: *University-industry cooperation, co-publication, disciplinary interplay*

1. INTRODUCTION

In the modern society, the production and utilization of knowledge have become increasingly important, and the concept of the third mission activity (TMA) of higher educational institutions (HEI) has attracted more and more interest (Piirainen, Andersen & Andersen, 2016). The TMA, in addition to the two fundamental missions – teaching and research activity – has appeared since the 1900s, defined as all activities that HEIs perform in relation to their external environment. These actions deal with social, and more importantly, the economic impact of universities (Glaser, O'Shea & de Gery, 2014). The major "trigger" behind TMA is the transformation of the economy to knowledge-based economy. Thus, universities provide the necessary knowledge and innovation capacity for local and global businesses to be a competitive partner in the business ecosystem, with special attention on innovation (Etzkowitz & Leydesdorff, 1997; Laredo, 2007).

Therefore, universities, and within universities academicians, managers and decision makers started to focus more on the role of HEIs in local and global businesses as well as on their commitment to the community (Zomer & Benneworth, 2011). Universities are continuously shifting from their traditional teaching and scientific knowledge providing role to a more complex "entrepreneurial" university model, in order to incorporate commercialization of created knowledge to their portfolio and actively contribute to the development of the local and global region (Etzkowitz & Leydesdorff, 2000; Etkowitz, 2003). The interaction and knowledge transfer between universities and industrial partners has been proven to be mutually beneficial for both partners, including the potential increase of local and global economic growth, (Yegros-Yegros et al., 2016), which, in turn, serves as a channel boosting exchange and co-production of information, knowledge, and other resources (Perkmann & Walsh, 2007). As described in the work of Ankrah & AL-Tabbaa (2015), university-industry collaboration (UIC) corresponds to the interaction between any parts of HEIs and industry aiming mainly to encourage knowledge and technology exchange (Bekker & Freitas, 2008; Siegel, Waldman, & Link, 2003). Universities and industrial partners are increasingly recognizing the benefits of collaboration and co-creation. On one hand, industrial partners are gradually utilizing open innovation strategies to better incorporate relevant information enabling the cooperation with universities. On the other hand, universities have begun to adopt advanced teaching and research methods helping to rectify the challenges faced by industry and directly contribute to economic success. Thus, the TMA has an extensive impact on the regional and global economic growth and can be perceived as a driving force of UIC (Glaser, O'Shea & de Gery, 2014). As reviewed by Ankrah and Al-Tabbaa (2015); Franco & Haase (2015); Tijssen, Yegros & Winnink (2016); Yegros-Yegros et al. (2016) and Rybnicek & Königsgruber (2019), UIC has a long tradition and play a significant role in the economic growth of the knowledge-based societies. The UIC represent a significant support of TMA, particularly in the research, development and innovation dimension, when both HEI and industry representatives set out to define common vision and goals (Piirainen, Andersen & Andersen, 2016). Based on the work of Santoro and Chakrabarti (2002) and Wong & Singh (2013), the collaboration between HEIs and industry may be categorized into four different components based on the degree of interactivity and specificity of focus. The first category, *research support*, is the lowest degree of interactivity and is characterized by direct financial or equipment contribution from the industrial partner. The *cooperative research* shows higher degree of interactivity and specificity through contract research or consultancy, when HEIs solve the problem of industrial partners through fixed conditions. The *knowledge transfer* includes ongoing personal interactions, cooperative education, characterized by more interactive but less focused interactions. Finally, the *technology transfer* is highly interactive and more focused compared to previous three categories, and is responding to specific industry issues through commercialization of university-based knowledge. In addition, D'Este et el. (2019) proposed an analytical framework to provide a comprehensive map of the diversity of University-Industry links. They categorized this interaction based on two critical dimensions: the *type of contractual agreement* and the *degree of specificity*. The type of contractual agreement refers to the extent to which UICs are governed by frequent and personal-based relationships; and to the extent of tacit and codified knowledge exchange. A crucial driver of this collaboration is the market, triggering knowledge commercialization. Jensen & Thursby (2001) confirmed that these market-mediated activities often require the direct involvement of inventors and technology-transfer offices from the university. The common goal is to commercialize the technology**.** The type of goal specificity can be described by a situation when a university researcher, based on frequent interactions with industrial partners, reflects on the targeted industry needs. The cooperation can be manifested in a Research & Development agreement or contract, when the industrial partner, based on the expertise and knowledge of researchers, defines the goals.

This interaction is depicted as a high goal specificity. Int his case, the research is based on a former invention or research, with high potential to enter the market. The contrasting type goal specificity within University-Industry Collaboration, introduced by Kilduff, Mehra & Dunn (2011), is the so-called low goal specificity, when the research agreement between the university and industry is based on research, where the anticipated results and achievements are uncertain. However, the university-industry interactions can take many forms, which authors classify in a different way (Piirainen, Andersen & Andersen, 2016; Ankrah & Al-Tabbaa, 2015). Moreover, the factors influencing UIC are also several fold: whilst Ankrah & Al-Tabbaa (2015) marked motivation as the major factor, Rybnicek & Königsgruber (2019) identified 4 main categories: 1 – institutional factors, 2 – relationship factors, 3 - output factors and 4 - framework factors. Based on the work of Rybnicek & Königsgruber (2019), we divided several other factors highlighted by the literature into these 4 groups (Supplementary figure 1). These factors are: research skills; innovation culture (Meissner & Shmatko, 2019); engagement to interdisciplinary and innovation (D'este et al., 2019); previous experience with UIC (Klásová, Korobaničová & Hudec, 2019); public support of UIC (Anderson, Odei & Anderson, 2018); bureaucracy and flexibility/inflexibility of HEIs; willingness to change; communication, commitment, culture; the strategy, vision, goals, plans and expected results of collaboration including the question of publication or commercialization (the question of so called "publish or perish" of researchers vs. patenting approach of industrial partners); the governmental support, legal restrictions, local and global market environment; presence or lack of regulations, geographic distance (Rybnicek & Königsgruber, 2019), responsibility of HEIs staff and researchers (Perkmann et al., 2013); the frequency and type of communication among partners; as well as the understanding of rational choices (Rast, Tourani & Senin, 2015). Since the collaboration among HEIs and industry has increased, the need for monitoring and measuring the outcomes of UICs has appeared as well (Grimaldi & Von Tunzelmann, 2002). However, besides the type of interaction as performance indicator is itself not enough, and the outcomes of these interaction should be also taken into account (Pertuzé et al., 2010). According to Perkmann, Neely & Walsh (2011) several metrics can be used to measure the outputs of UIC, such as patents/intellectual property rights, publications, and learning metrics. They suggested a performance measurement system for evaluating the success of UIC, including quantitative (like patents, publications and intellectual property rights) and qualitative indicators (social relationship, organizational arrangements or motivation). Moreover, the outcome of cooperation is also important indicator of UIC (Pertuzé et al., 2010). Bibliographic metrics are in good position to measure the researcher's capability, moreover, they can be used as an indicator if UIC. The joint research publications are an explicit indicator of UIC, which are suitable for evaluating university-industry research collaboration (Tijssen, 2012; Tijssen, Leeuwen & Wijk, 2009). The university-industry joint publications, in which at least one university and one private sector organization is included, can partially overcome the problem of the lack of publicly accessible information (number of research contracts, number and type of joint projects with industry, number of licenses) (Yegros-Yegros et al., 2016). Furthermore, it can be used to predict the universities' technology commercialization outputs: patenting, spin-off creation and licensing opportunities (Wong & Sing, 2013). However, university-industry co-publications, like other quantitative measures, are far from being considered perfect measures of UIC (Yegros-Yegros et al., 2016). It was discussed by Katz and Martin (1997), that not all research collaboration lead to co-publication, and only some tangible aspects of UIC can be quantified. Similarly, Seppo and Lilles (2012) highlighted, that only the publication count is not a reliable tool to estimate the success of university-industry cooperation, as industry is interested rather in applied than basic research, and from the side of industrial partners, publications are not necessary. Other significant limitation is the "multiple" affiliation of researchers, when one or more authors indicate both university and industrial affiliation in the

publication (Yegros-Yegros & Tijssen, 2014). One approach to overcome the abovementioned limits, the quality of university-industry co-publications should be evaluated by considering several other factors. In modern science, more and more complex problems appear, which, according to D'este et al. (2019) and Hessels & Van Lente (2008) can be more effectively solved by bringing together disconnected and/or atypical knowledge spaces. It has been shown by Giuliani et al. (2010) and van Rijnsoever, Hessels & Vandeberg (2008), that the combination of these research fields is in good position to foster UIC. In addition, D'Este et al. (2019) found, that those scientist, who are performing interdisciplinary-oriented research, are more strongly associated to market-mediated research, and are more likely to engage in UIC compared to less interdisciplinary-oriented university researchers. Therefore, the investigation of co-published outputs taking into account the interplay between different scientific fields could be a potential indicator of UIC. Considering the limited number of patent application in Hungary and difficulties with the availability of crucial data service of qualitative and quantitative parameters describing UIC, our aim is to highlight the use of university-industry co-publication data as a suitable tool to be used as an indicator if university-industry collaboration. In addition to the number of co-published papers, easily obtained from multiple databases, the number of scientific disciplines and the connection between them can also be used to describe UIC. The novelty of the study lies in the evaluation of university-industry collaboration by the use of bibliographic in the light of cooperation across different scientific fields.

2. METHODOLOGY

In order to analyze university-industry co-publication activity and co-published papers, first, we selected our Hungarian model universities. Based on the QS World University Rankings 2020, six Hungarian universities were chosen: University of Szeged (rank 501-550), University of Debrecen (rank 601-650), Eötvös Loránd University (rank 651-700), University of Pécs (rank 651-700), Budapest University of Technology and Economics (rank 801-580) and Corvinus University of Budapest (rank 801-580). After university selection we used the Clarivate Analytic's Web of Science (WoS) to obtain the number of all Wos documents for a 5-year long time period between 2014 and 2018, including the number of industrial collaboration (Table 1).

	2014		2015		2016		2017		2018	
University	WoS	Ind	WoS	Ind	WoS	Ind	WoS	Ind	WoS	Ind
University of Szeged	1234	25	1226	26	1191	36	1317	27	1273	25
University of Debrecen	1297	21	1183	19	1198	26	1256	32	1262	35
Eötvös Loránd University	1068	18	1062	13	1174	17	1320	15	1409	40
University of Pécs	788	18	737	16	720	10	835	17	878	16
Budapest University of Technology and Econ.	1149	55	1271	68	1242	65	1293	61	1178	51
Corvinus University of Budapest	240	0	262	1	237	2	196	0	170	0

Table 1: The number of Wos publications and industrial collaborations (co-published papers) of selected Hungarian universities. WoS = the number of Web of Science records, Ind = the number of papers marked as Industrial collaboration.

For further analysis of university-industry co-published papers, based on the OECD research area schema, we classified scientific disciplines of each paper for a 5-year time period, between 2014 and 2018. As Corvinus University of Budapest has only 3 university-industry co-published papers for this time period, we excluded it from further investigation. The OECD subject classification scheme is a valuable tool for looking at national level bibliometric indicators, and is based on external subject classification developed in partnership with research evaluation bodies in the region. It is broken up into 6 major codes (1. Natural sciences, 2. Engineering and technology, 3. Medical and Health sciences, 4. Agriculture, Forestry, and

Fisheries, 5. Social sciences, 6. Humanities), which are consequently divided into 42 minor codes (http://www.oecd.org/science/inno/38235147.pdf). Based on the OECD results we divided publication into three different groups: *SINGLE* represents papers which contain only one minor code; the *INTERDISCIPLINAR* group is represented by papers which contain two or more minor codes from the same major code; and *TRANSDISCIPLINAR* group collects those papers which are marked with two or more minor codes from two or more major codes. For visualizing the network of cooperation across different scientific field we used Gephi, an open source software. For all papers, we identified the main research field, corresponding to 1 of the 6 major OECD codes. Based on the OECD minor code classification we identified all possible scientific field pairs, and calculated the number of all connections. In case of papers where three or more minor codes, we calculated the number of all possible unidirectional pairs. For example, in case of paper No 29 at the University of Szeged 3 minor categories were present: 1.06 Biological sciences, 3.01 Basic medical research, 3.02 Clinical medicine. The number of pairs was established as: 1.06 Biological sciences to 3.01 Basic medical research (n=1), 1.06 Biological sciences to 3.02 Clinical medicine (n=1), and 3.01 Basic medical research to 3.02 Clinical medicine (n=1).

3. RESULTS

3.1. Co-publication of scientific papers as indicator of university-industry collaboration

The total number of annual WoS documents and co-published papers with industrial partners is shown in Supplementary figure 2. We found significantly positive correlation between the annual publication intensity in case of the Eötvös Loránd University (correlation coefficient r = 0.96), and significantly increasing industrial co-publication activity at the University of Debrecen (correlation coefficient r = 0.96). The proportion of co-published papers varied between 0.27-4.89% (calculated as the ratio of 5-year sum of co-published papers and all WoS records), in the following order: Corvinus University of Budapest (0.27%), Eötvös Loránd University (1.7%), University of Pécs (1.94%), University of Debrecen (2.14%), University of Szeged (2.22%) and Budapest University of Technology and Economics (4.89%). These discrepancies in co-publication intensity can be attributed to the different teaching and research profiles of universities. Whilst the Corvinus University of Budapest has its research focus predominantly in the field of economics, management and social sciences, the Budapest University of Technology and Economics focuses on 6 priority research areas, including sustainable energy, vehicle technology, biotechnology, nanotechnology and disaster prevention. The research portfolio of the remaining 4 universities (University of Szeged, University of Debrecen, Eötvös Loránd University, University of Pécs), compared to previous universities, are more diverse, covering the main branches of sciences.

3.2. The type of university-industry collaboration based on co-published papers

In the next step we analyzed the type of collaboration between universities and industrial partners (Supplementary figure 3). First, we categorized each paper based on the number and type of scientific disciplines, for each university, between 2014 and 2018. We established 3 different categories: 1 – SINGLE, where only one scientific discipline (minor code) was present, 2 – INTERDISCIPLINAR, including papers with two or more different scientific disciplines (minor codes) from one major discipline (main code), and 3 – TRANSDISCIPLINAR, where at least two or more different disciplines were present (minor codes) from two or more main disciplines (major codes). As it is shown on Supplementary figure 3, the majority of papers belongs to SINGLE group, followed by TRANSDISCIPLINAR and INTERDISCIPLINAR type of collaboration.

3.3. The network of scientific collaboration between universities and industrial partners

The calculation of all possible connection pairs between different scientific fields (minor codes) enabled us to have a closer look on the network of collaboration. Supplementary figure 4 visualizes the connection map of the Eötvös Loránd University and the Budapest University of Technology and Economics – the two universities showing the highest proportion of papers belonging to the INTERDISCIPLINAR and TRANSDISCIPLINAR group. We found a higher transdisciplinary cooperation of universities and industrial partners, compared to interdisciplinary collaboration. The highest proportion of transdisciplinary connections showed the University of Pécs (68%), followed by the Budapest University of Technology and Economics (67%), the University of Szeged (62%), the University of Debrecen (61%) and the Eötvös Loránd University (58%) (Table 2).

Collaboration type	University of Szeged	University of Debrecen	Eötvös Loránd University	University of Pécs	Budapest University of Technology and Economics
Scientific field	16	14	17	12	19
No. of all connections	50	38	61	28	150
INTERDISCIPLINAR connections	19	16	24	9	50
TRANSDISCIPLINAR connections	31	22	37	19	100

Table 2: The number of interdisciplinary and transdisciplinary cooperation for each Hungarian university (based on co-published papers with industrial partners), for a 5-year time period between 2014 and 2018. Note the higher number of connections for the transdisciplinary type of collaboration.

The highest connections were observed between the following scientific fields: 3.03 Health Science to 5.02 Economics and business (n=17, Eötvös Loránd University), 1.02 Computer and information sciences to 2.02 Electrical engineering, electronic engineering (n=18, Budapest University of Technology and Economics) and 3.01 Basic medical research to 1.04 Chemical sciences (n=15, Budapest University of Technology and Economics). We found only one collaboration where one scientific field belongs to Agriculture, Forestry, and Fisheries major code. Subsequently, no connection was found where at least one scientific field represents Humanities. Taking together, similar to Velencei et al. (2016) we are able to create a three-stage process of data validation, including data collection from available databases, subsequent data correction in order to test the relevance of data, and finally, the validation the applicability of our observation based on the disciplinary interplay of individual co-published papers (Supplementary figure 5).

4. CONCLUSIONS

Despite the variety of cooperation types of UIC and indicators available to measure its outputs, there is still a need to find other approaches to highlight the quality of engagement of HEIs with industrial partners. In order to overcome the discrepancies regarding to different outputs of ordinary university-industry cooperation (such as different performance of universities and dissimilar local and governmental regulation) (Ankrah and Al-Tabbaa, 2016), we described the variety of cooperation types of UIC in a new way. In this paper we show that our approach of bibliometric data collections characterizing university-industry co-publication are consistent, relevant and applicable tool do determine UIC. In order to describe the interplay of three phases of university-industry co-published papers validation, we used the approach of Velencei et al. (2016), and described three different, but subsequent stages. The process includes not only data collection from the available databases (data collection), but also the categorization (relevance

of data, e.g. correction) and further analysis (applicability) of university-industry co-published papers in the light of research performance interplay between different scientific disciplines within and between major superordinate scientific fields (Figure 5). By determining the type of collaboration and correcting the data considering the number and connection of scientific disciplines, we can provide a new tool reliable to evaluate university-industry cooperation. Now, our aim is to reach a next level of validation that has never been used to analyze university-industry cooperation. To do so, we are going to test our approach by including other, significant and available output indicators of university-industry co-published papers.

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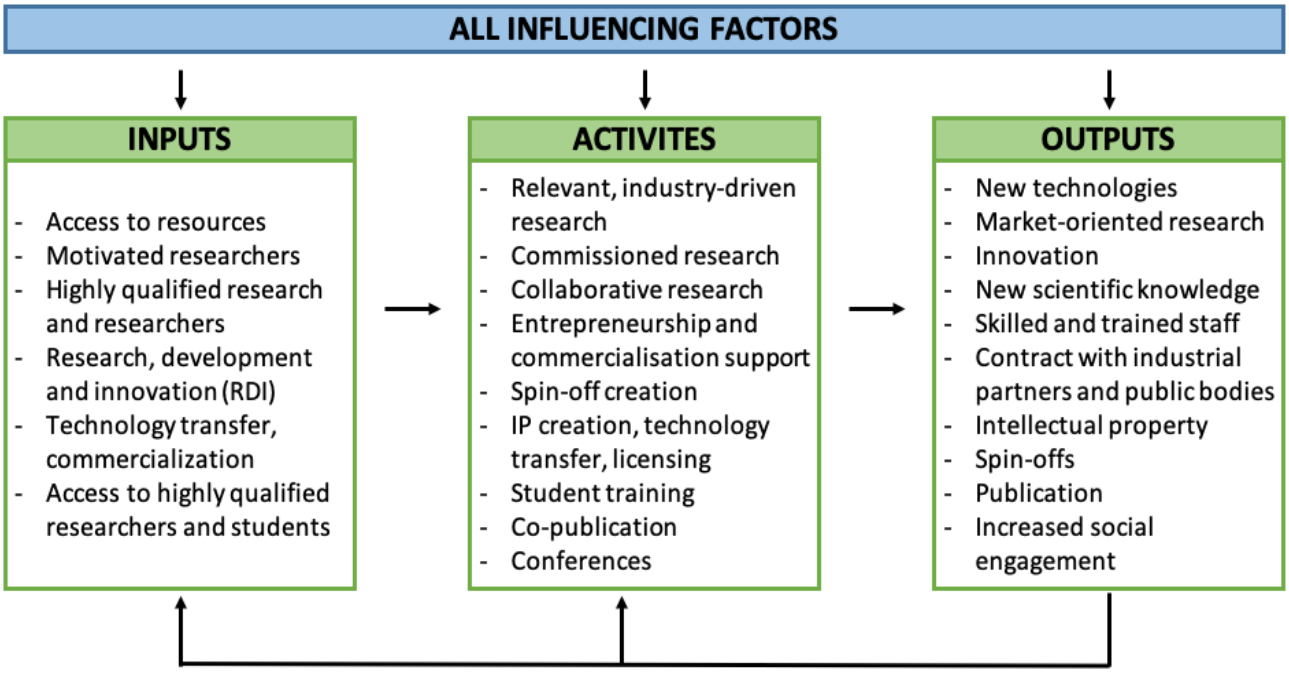
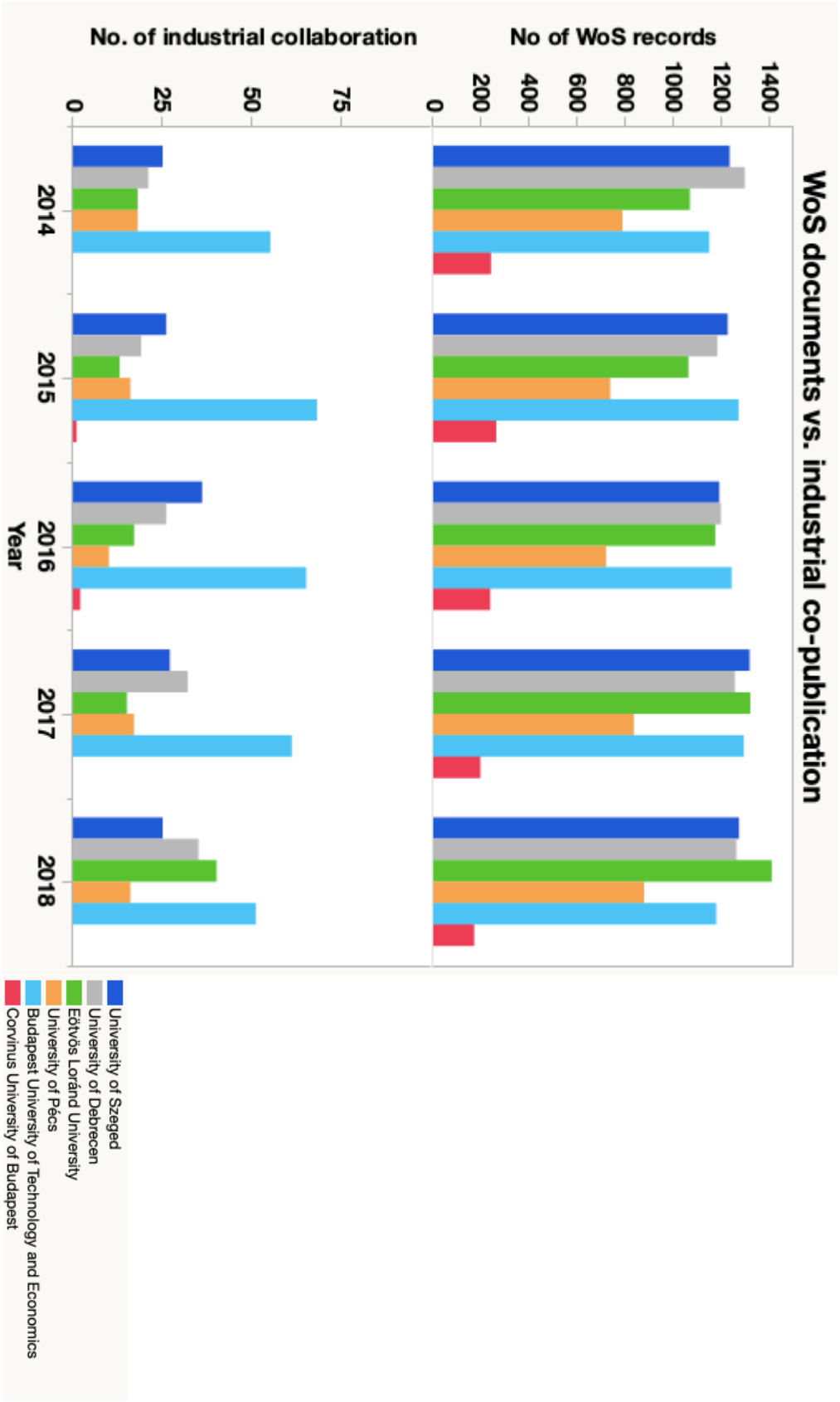
APPENDIX

Supplementary material

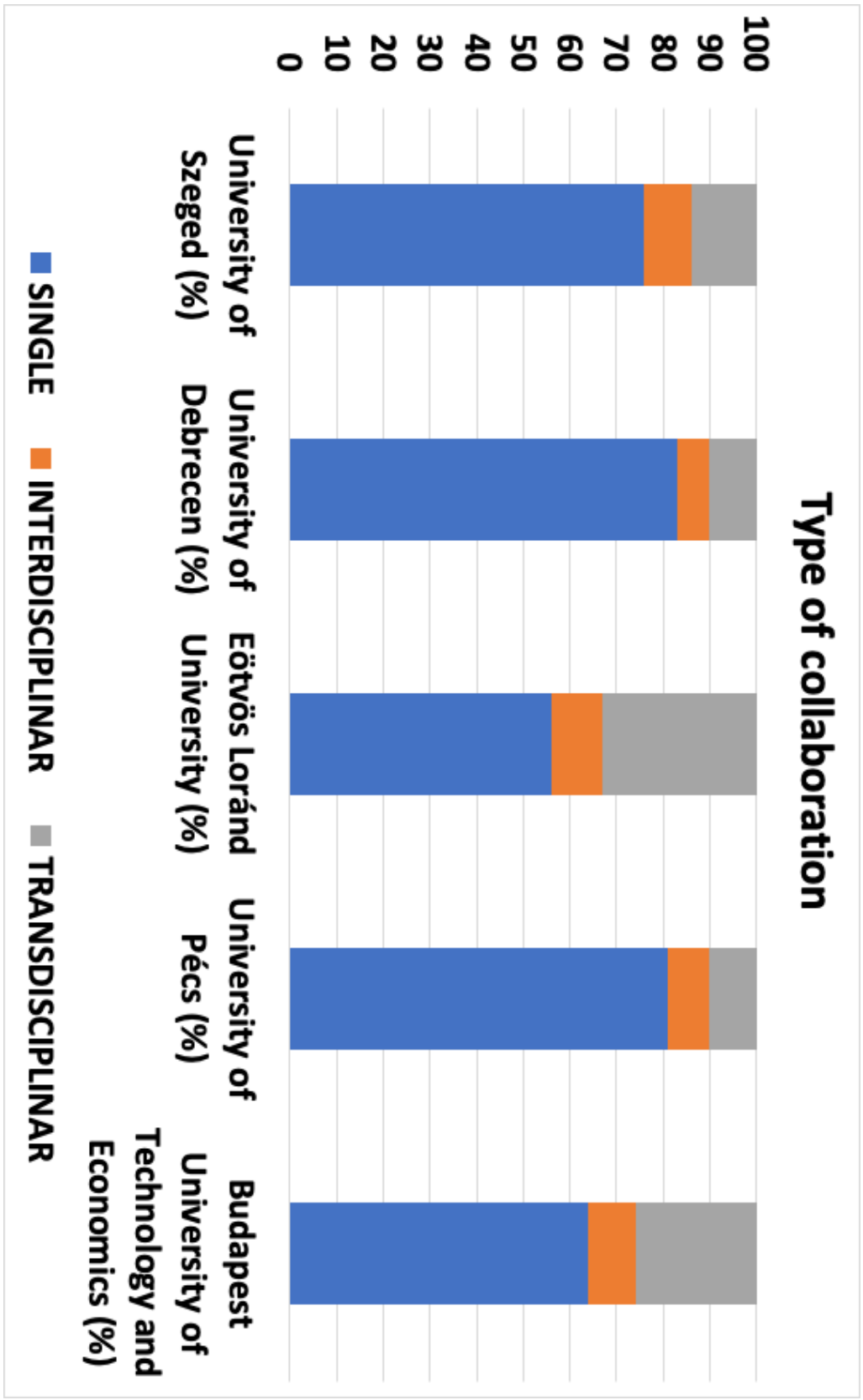
MOTIVATION			
INSTITUTIONAL factors	**RELATIONSHIP factors**	**OUTPUT factors**	**FRAMEWORK factors**
research skills, innovation culture; resources of partners, engagement to interdisciplinary and innovation; previous experience and public support of UIC; bureaucracy and flexibility/inflexibility; responsibility; willingness to change	communication, commitment, culture, trust; frequency and type of communication among partners; ability to identify responsibilities of each partner	strategy, vision, goals, plans and expected results of collaboration; publication vs. commercialization	the governmental support, legal restrictions, local and global market environment; presence or lack of regulations, geographic distance



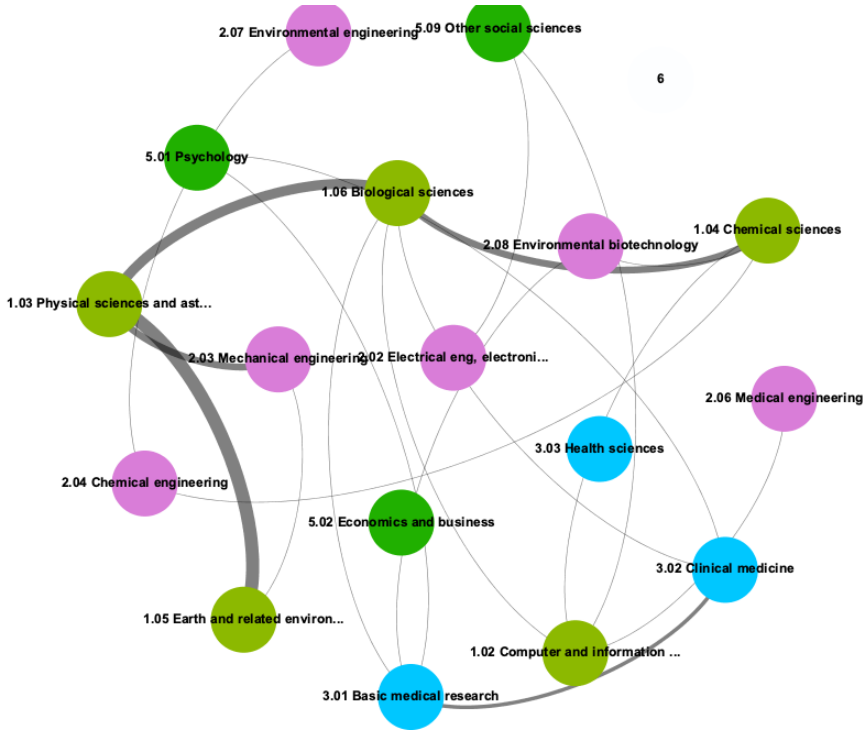
Supplementary figure 1: Illustration of the University-industry collaboration framework. The blue-shaded boxes represent the major factors influencing university-industry collaboration, the blue-white boxes include the factors divided into the main major categories established by Rybnicek & Königsgruber (2019). According to the conceptual process framework of university-industry collaboration by Al-Tabbaa (2016), we included motivation as the 5th major factor. These categories with all mentioned other factors create the main inputs of the input-activity-outcome process of university-industry collaboration (green-shaded and green-bordered boxes).



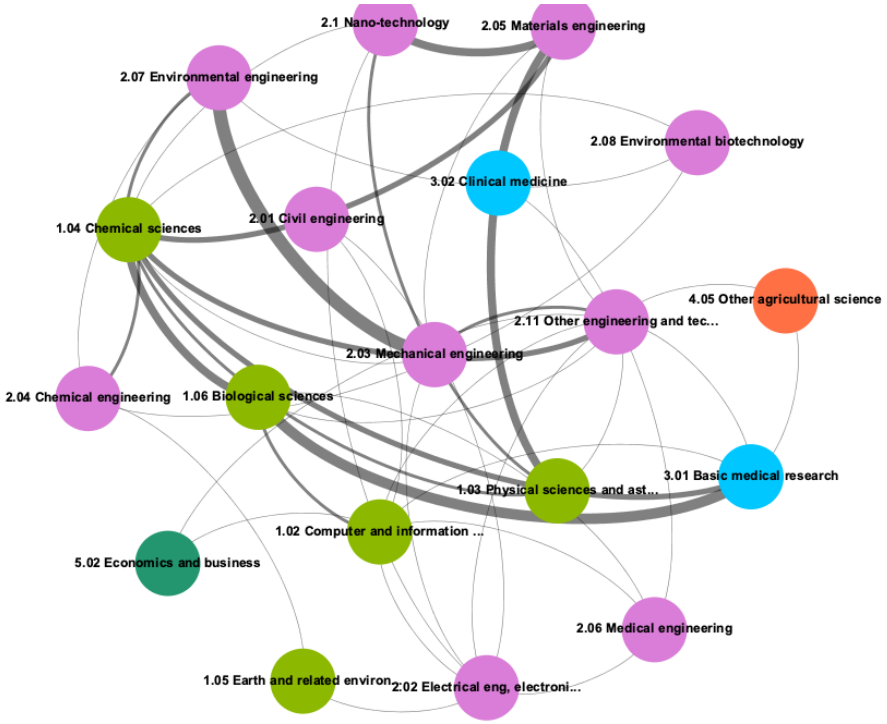
Supplementary figure 2: The number of annual Wos publications and co-published papers at 6 Hungarian universities. Note the difference scaling of Y axes. Whilst in case of Wos publication (upper) it ranges between 0 and 1500, in case of industrial collaboration it is set between 0 and 100 for better visualization.



Supplementary figure 3: The type of collaboration between Hungarian universities and industrial partners was calculated from the marked scientific fields of co-published partners. Note the prevalence of SINGLE collaboration, followed by TRANSDISCIPLINARY and INTERDISCIPLINARY type.

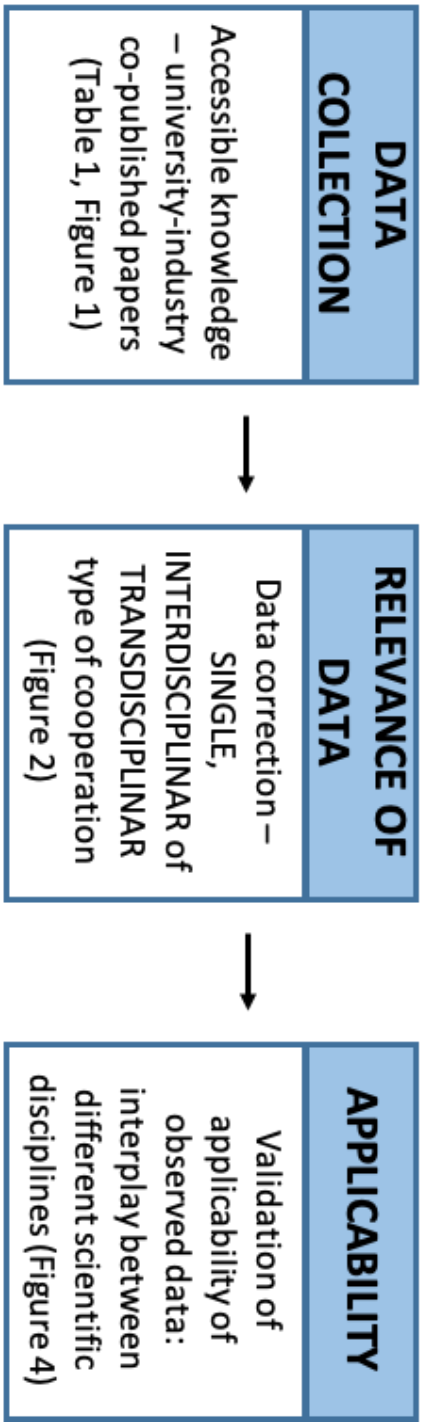


Eötvös Loránd University



Budapest University of Technology and Economics

Supplementary Figure 4: The picture shows the connections between different scientific fields of university-industry co-published papers, 2014-2018. Colored dots represent the major code (1 – light green, Natural sciences; 2 – purple, Engineering and Technology; 3 – turquoise, Medical and Health sciences;4 – orange, Agriculture, Forestry, and Fisheries; 5 – dark green, Social sciences), the three-digit number represent the minor code within a major code. The curved lines represent the strength of connection – the thicker the line, the higher the connection is.



Supplementary figure 5: The three-stage process of data validation

A REVIEW OF BIG DATA FOR THE SUSTAINABILITY OF AGRI-FOOD SUPPLY CHAINS

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ABSTRACT

Research on the sustainable management of agri-food supply chains (AFSCs) has garnered much attention in recent years. The reason for this increased focus is attributed to pressing consumer demands for food safety and quality. To sustain their operations, agri-food organizations have to reconsider new ways, methods, and technologies that can consolidate AFSCs and ensure a consistent supply of safe foods to consumers. A potent example of such solutions is big data. Therefore, the goal of this paper is to explore the possibilities of big data for AFSC sustainability. A sample of 128 journal articles was considered to identify the critical role of big data in the agri-food industry. To systematize the extant literature, the author abductively developed a framework consisting of well-established concepts in AFSCs and analyzed the literature accordingly. The results of the review revealed that big data has the potential to improve the management of AFSC resources and processes. In this respect, resources mainly include soil and water, whereas processes include plant/ crop management, livestock management, waste management, and traceability management. The barriers to big data adoption in AFSCs are highlighted briefly along with some concluding remarks. To the author's best knowledge, this study represents the first of its kind to investigate big data as a driver for sustainable AFSCs.

Keywords: *Agri-food supply chains, Big data, Sustainability, Soil, Water*

1. INTRODUCTION

More recently, agri-food supply chains (AFSCs) have undergone a series of fundamental changes that have remarkably reshaped the ways firms operate and deliver food products to consumers (Marques Vieira et al., 2013). Besides being characterized by their complex, fragmented, and disjointed processes, AFSCs face pressing challenges associated with several parameters, such as cost, raw material availability, and volatile exchange rates (Christopher, 2011; Holweg et al., 2005; Vlajic et al., 2013). Consumer concerns over food quality and safety have increased as a result of the recurrent food scandals and ethical lapses, ranging from the horsemeat scandal in Europe to the melamine incident in china (Elliot, 2014). The management of AFSCs is a challenging task since several vulnerabilities are arising from the limited shelf-life of food products, their high perishability, and the rapid degradation of their quality. In addition to these concerns, increased calls for sustainability in the agri-food industry have intensified, and there is a need to consider new technologies as better alternatives to the traditional ones (Sun, 2014) to manage AFSCs more sustainably. Through the digitization of AFSCs, it would be feasible to enlarge the market potential of agri-food firms and enhance their competitive position in the increasingly dynamic market of food products. Big data represents one of the new emerging technologies that agri-food firms can rely on to improve the management of their AFSCs. As per Subudhi et al. (2019), big data consists of large, heterogeneous, and massive datasets that require high processing capabilities. The concept of big data is new, and it highlights the importance of data to extract relevant insights. This data is generated from a variety of sources like the internet of things (IoT) devices, agricultural sensors, and other consumer tracking methods. In the academic literature, several attributes of big data exist, including volume, velocity, variety, and value (Aljunid and Manjaiah, 2019).

The combination of these attributes has focalized strong focus and attracted the interest of scholars across many disciplines. Beyond the discussion of these technical attributes, big data is a key tool for the formation of more sustainable AFSCs due to its high capabilities and the versatility of its applications. Agri-food firms would inevitably take advantage of the adoption of big data in their AFSCs. Therefore, the purpose of this study is to investigate the potentials of big data for AFSC sustainability. As of the time of writing, there is a lack of studies showcasing the role of big data as a driver for the development of sustainable AFSCs. Hence, the current research intends to bridge this knowledge gap and to share in the broader discussion on how data-driven AFSCs can foster sustainability. To achieve this goal, a systematic literature review (SLR) is employed to capture the latest developments in this research area, identity what has been studies on the topic, and needs further investigation. The research question of the study is the following:

- How can big data support agri-food business in the development of sustainable AFSCs?

The discussions elaborated in this study offer a deeper understanding of the potentials of big data for AFSC sustainability. The contributions of this research are manifold. First, the emergence of big data technologies and the increasing digitization of AFSCs give a sound justification for conducting this review. Second, we believe that by exploring the possibilities of big data-enabled AFSCs, we can extend the general discussion on new technologies and their impact on AFSC sustainability. Third, we argue that the complexities and dynamics of the agri-food industry necessitate the introduction of new technological solutions that unlock the value of data in AFSCs and assist managers and policymakers in making evidence-based decisions (Coble et al., 2018). The organization of the paper is as follows. After the introduction, we present the review methodology, and the procedure followed for the selection of literature. The third section provides the descriptive statistical results of the review. After then, a conceptual framework is abductively developed and used to systematize the selected literature and to provide answers to the research question of the current study. Finally, conclusions are drawn in the last section.

2. RESEARCH METHOD

This study used an SLR to investigate the potentials of big data for agri-food sustainability. An SLR is a useful approach that enables scholars to identify the current status of knowledge in a particular domain and to communicate the results of past studies (Tranfield et al., 2003). To streamline the search process, we followed the PRISMA guidelines of Liberati et al. (2009), which comprise three steps: (1) the definition of the search process and sample, (2) the initial descriptive analysis of the sample, and (3) the analysis of the literature. Cronin et al. (2008) highlight the importance of developing a precise research question for a literature review. Accordingly, the goal of this study is to synthesize the extant literature on big data and its potentials for sustainable AFSCs. Guided by the aforementioned research question, the author consulted Scopus, a leading academic database, to extract peer-reviewed journal articles that are relevant to the scope of this study. The search query used was:

- *"big data" AND (sustainb* OR environ* OR eco* OR green* OR social OR societal OR ethic* OR CSR OR eco- OR efficiency OR "triple bottom line" OR TBL) AND (food* OR "agri*" OR perishable* OR fruit* OR vegetable* OR "cold chain" OR fresh*)*

The search query mainly consists of three important strings. The first string represents big data, the second string comprises all terms in relation to sustainability, and the third string comprises all terms closely linked to AFSCs. To ensure the validity and reliability of the search, these terms are formulated based on an initial screening of the literature.

The subject areas were limited to *Agricultural and Biological Sciences; Social Sciences; Decision Sciences; Environmental Science; Business, Management and Accounting; Economics, Econometrics and Finance*. Only journal articles in English were selected. The initial search query returned 311 papers to be initially screened for relevance based on their titles, abstracts, and keywords. After undertaking this step, the author is left with 128 articles, all of which are relevant to the scope of the present study and drawn for the final review and analysis.

3. THE INITIAL DESCRIPTIVE ANALYSIS

3.1. Year-wise distribution of publications

To unravel the evolution of big data research within the context of AFSCs, the author classified the articles according to their year of publication. As shown in Figure 1, the first article addressing the topic was published in 2014. After that, the number of publications has increased significantly since 2016. The interest in big data applications in the agri-food industry has amplified, and this is manifested in the sharp upward trend in the number of articles during the period 2016-2019. As of the time of writing, the author feels that the number of articles will increase vigorously due to the increasing awareness of the capabilities of digitization, in general, and big data, in particular.

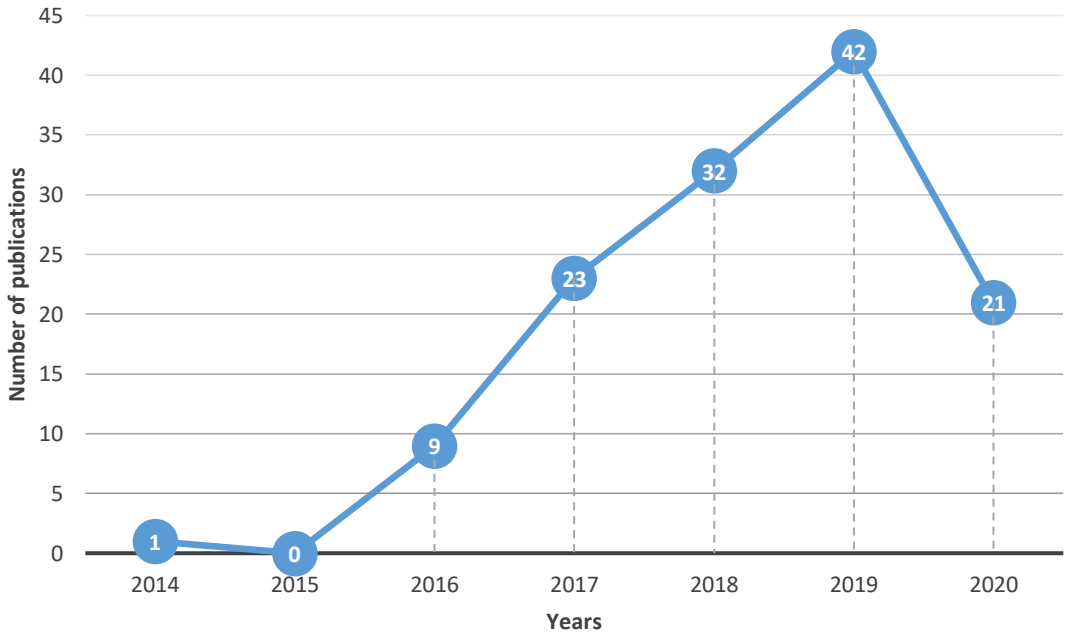

Figure 1: Distribution of big data- AFSC research according to year of publication

3.2. Country-wise distribution of publications

The author' affiliations were extracted for the classification of the selected studies according to the contributing countries. Figure 2 depicts all countries representing at least five journal articles in our final sample. Researchers from the USA were the most productive contributing with 34 publications to the literature. To a lesser extent, China was ranked second on the list, with researchers publishing 30 articles. Scholars from India, Australia, and the UK published 15, 13, and 13 papers, respectively. The country-wise distribution of publications indicates that big data attracts the attention of researchers that are affiliated to academic institutions located in different countries, (Jara-Rojas et al., 2013; Sarangi et al., 2004; Sarkar et al., 1995)reflecting the reduction of the digital divide between the developed and developing worlds.

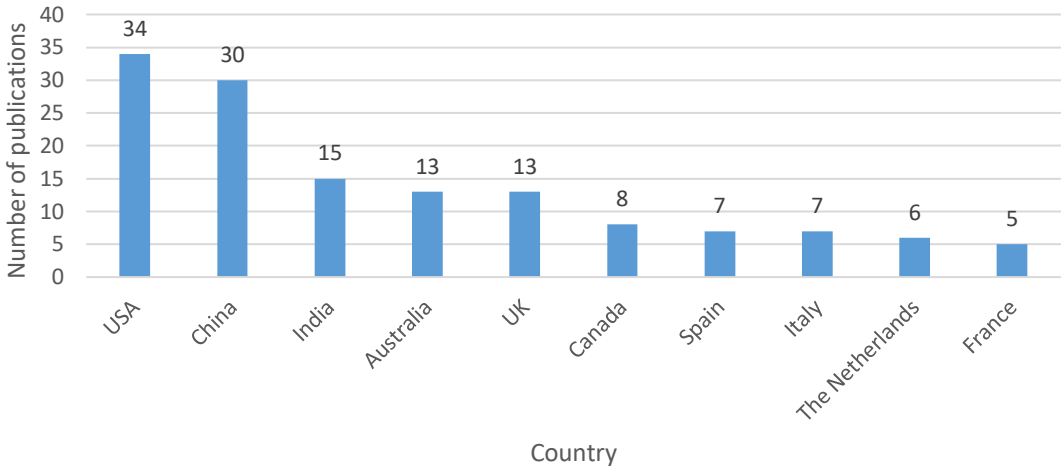

Figure 2: Country-wise distribution of publications

3.3. Journal-wise distribution of publications

Figure 3 illustrates the journals publishing three papers or more on big data within the context of sustainable AFSCs. *Computers in Electronics and Agriculture* is the dominant journal contributing to the literature with nine (9) papers. Six (6) papers were published in *Revista de la Faculatd de Agronomia*. *NJAS- Wageningen Journal of Life Sciences* and *Journal of Cleaner of Production* published four papers each. The papers in our final sample appeared in ninety (90) peer-reviewed journals. We discovered that a small number of articles explored the triangle of big data, AFSCs, and sustainability. Given the recent interest in big data and its opportunities for achieving sustainable AFSCs, a serious focus on the technology is missing thus far.

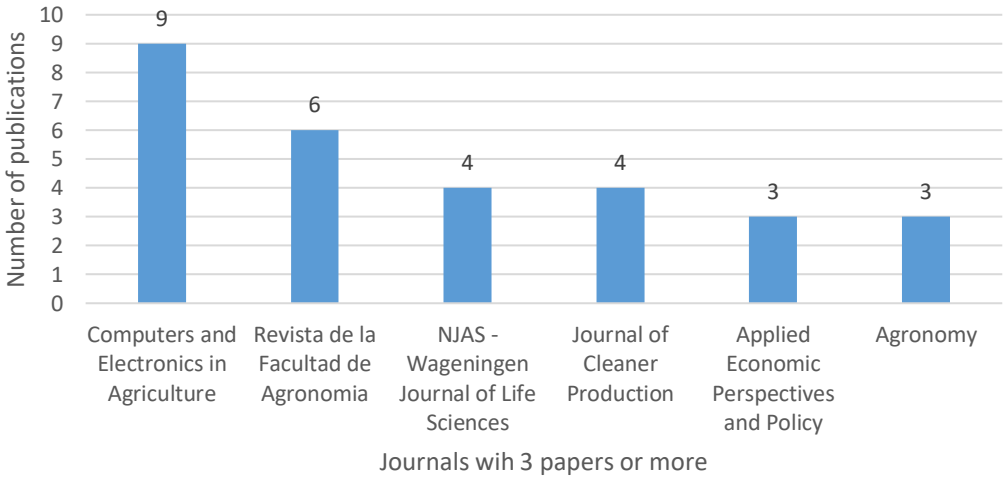

Figure 3: Journal-wise distribution of big data research in AFSCs

4. ANALYSIS OF THE LITERATURE

This section represents the central body of the research. In the upcoming subsections, we provide our answers to the research question and our analysis of the literature. To obtain a systematic presentation of the findings, we abductively developed a conceptual framework based on the specificities of AFSCs. As such, we assume that a typical AFSC consists of two main constructs; resources and processes (see Figure 4). The former include soil and water.

Consistent with a solid stream of literature, these resources are considered the two most essential for agri-food productions (Jara-Rojas et al., 2013; Sarangi et al., 2004; Sarkar et al., 1995). The latter consists of four main processes that emerge from the basic definition of the AFSC, namely, crop/plant management, livestock management, waste management, and traceability management (Astill et al., 2020; Munz et al., 2020; Otles et al., 2015).

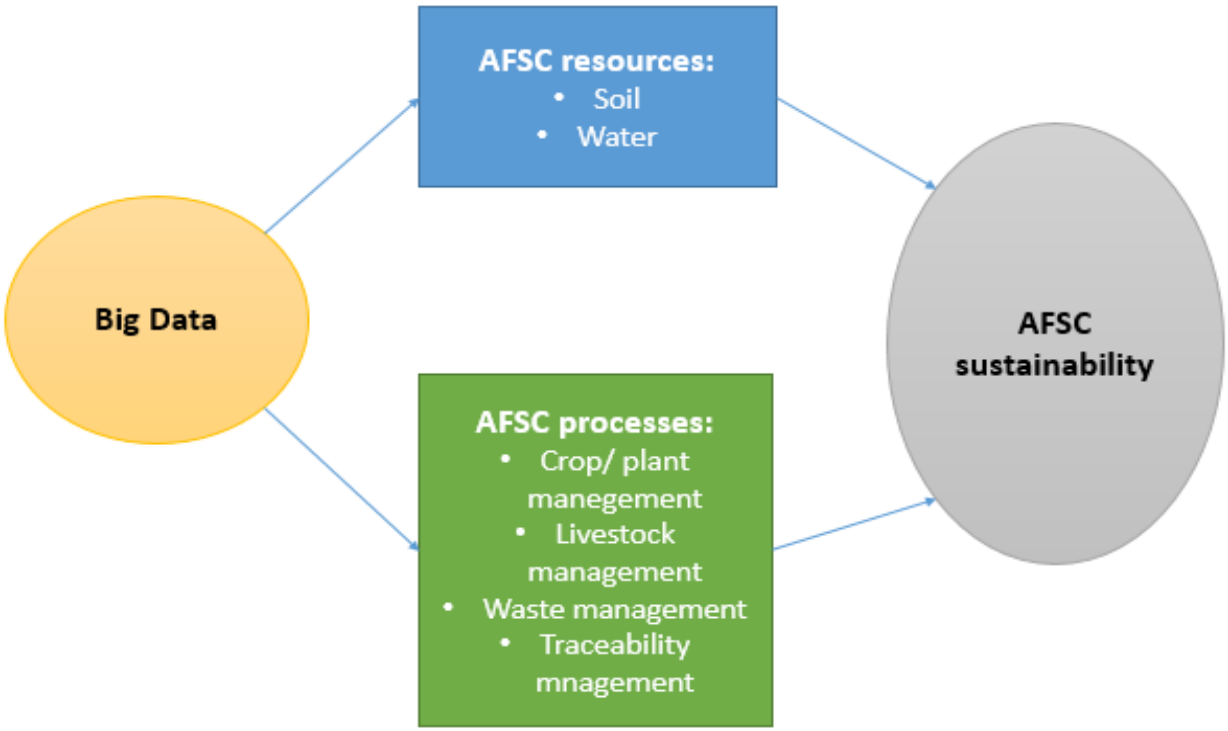

Figure 4: A conceptual framework for the systematization of literature

4.1. Big data for sustainable AFSC resources

4.1.1. Soil

A considerable body of literature has noted that big data can sustain more effective cultivation practices that are essential for preserving soil fertility. For instance, a study by Hou et al. (2020) posits that big data and machine learning tools simplify the capture, analysis, and exchange of data relating to soil. Through big data adoption, it would be possible to identify hidden patterns from soil datasets and gain the necessary information for determining soil conditions like nutrients, pH levels, and soil moisture (Finger et al., 2019; Kolipaka, 2020). The control of soil fertility measures could entail rich insights into the data characteristics of soil and aid farmers in the prediction of their crop yield and decision-making processes (Rajeswari and Suthendran, 2019). In this context, Garg et al. (2019) use big data along with machine learning methods to obtain knowledge from data. The authors believe that big data could help in the development of fertilizer recommendation classes on behalf of existing soil nutrition composition. The technology can automate all intelligent actions, resulting in healthy, decontaminated, and fertile soil. Therefore, the automation driven by big data systems is helpful for farmers to monitor AFSC activities through alerts and to make more effective decisions (Chapman et al., 2018; Coble et al., 2018; Hou et al., 2020). Access to big data is vital for performing soil data analysis and generating better knowledge associated with the nutrient contents of soil and the adequate quantity of fertilizers that can be applied, resulting in a more balanced nutrient soil content and optimal agricultural productivity (Garg et al., 2019).

4.1.2. Water

The digitalization of AFSCs through the use of big data is an auspicious opportunity for overcoming water sustainability issues. An influential study by Wolfert et al. (2017) highlights the value of big data applications in arming farmers with the predictive capabilities that are required for saving water while optimizing crop yields. Big data can optimize water use efficiency (Ciruela-Lorenzo et al., 2020) across various decision-making units in the agri-food industry. Similarly, big data-based climate models can help in the evaluation of annual agricultural conditions, development of annual agricultural production plans, the efficient use of water, and the mitigation of land degradation (Zhang and Huisingh, 2018). Big data has the potential to devise prescriptive plans for AFSC firms and assist in performing water audits and developing effective water policies (Weersink et al., 2018). To illustrate, Weersink et al. (2018) state that the combination of big data with IoT technologies for controlling water pollution of farms paves the way for developing predictive algorithms that can help organizations to adapt to the stochasticity of the environment. For regions lacking water resources, these algorithms can inform AFSCs players on how to combat water shortages and increase the sustainability of water systems. In addition, the analysis of big data enables AFSC actors to monitor water quality from the enormous data produced unceasingly from various sources (Kamilaris et al., 2018). Therefore, this assists AFSC stakeholders to develop more accurate and precise predictions of soil water patterns, to efficiently and effectively manage water resources, and to maximize crop yields (Cai et al., 2019). In a similar vein, big data is valuable for assessing environmental risks and raises AFSC actors' awareness regarding water issues. The incorporation of big data in the AFSC can significantly optimize water consumption, reduce the permanent loss of water (Reynolds et al., 2018), and solve issues related to water accessibility.

4.2. Big data for sustainable AFSC processes

4.2.1. Plant/ crop management

The exponential generation of data could represent a gold mine of knowledge regarding the performance of plants in terms of nutrient quality, stress tolerance, overall crop quality in different weather conditions, soils, and management practices (Halewood et al., 2018). The variety and richness of big data have the potential to increase the willingness of breeders and farmers to develop crop improvement programs and create more effective decision support tools (Chapman et al., 2018; Finger et al., 2019; Halewood et al., 2018; Serazetdinova et al., 2019). Moreover, big data aids farmers in mitigating the harmful issues that result from inappropriate crop protection practices as firms would be able to excavate valuable insights about the impacts of pesticides and other chemicals on crops (Carbonell, 2016). In their recent study, Zhang and Huisingh (2018) emphasize that big data is a foremost step towards more improved pest control, stating that research in this direction would forge a pathway to sustainable AFSCs. Li (2019) argues that the investment in a big data- based crop cultivation system could provide farmers with access to timely information, which is imperative to enhance the economic performance of AFSCs and maximize the added value of science and technology in AFSCs. Furthermore, Coble et al. (2018) propose that big data has prospective roles in resolving nutrient runoff concerns, which are the main reason for the degradation of water quality. The authors further argue that the use of big data tools could manage nutrient concerns by providing better evaluations, policies, and models of nutrient management strategies. Thus, big data can benefit cropping systems and enable to renovate management practices and enhance environmental sustainability through the mitigation of negative impacts and the formation of resilient AFSCs (Delgado et al., 2019).

4.2.2. Livestock management

Through the reliance on modern technologies, farmers can optimize their efficiency levels, while bringing less disturbances to the environment. On this point, Finger et al. (2019) and Weersink et al. (2018) assert that big data represents a key driver for smart animal farming, enabling farmers to meet the needs of each animal in real time. Tan and Yin (2017) argue that big data systems support animal breeders in producing sufficient animal feed, enhancing the usage of additives, eliminating wastage, and monitoring pollution from animal production. By analyzing big data, AFSC trading partners can gain a large amount of data to control their livestock and ameliorate animal health and welfare (Eastwood et al., 2019; Ramirez et al., 2019). Real-time data that are generated from IoT sensors could be treated, processed, and analyzed in order to unlock higher value from animal farming operations and promote more data-driven decisions (Astill et al., 2020). Additionally, the precious knowledge obtained from big data can lead to the development of individual diagnostic and herd-level management tools that are crucial for the monitoring of animal health and controlling high-risk physiological periods, thereby resulting in higher production and animal health benefits (Pralle and White, 2020). For sustainability to be realized, AFSC partners may capitalize on big data to extract actionable insights, maintain increased control over the ambient conditions of the farm, and enhance the economic return of their animal management operations. Overall, big data is a valuable supporting tool for precision livestock farming practices as it provides a variety of farm data, which is a baseline for analytical tools to enhance the care and management of livestock (Astill et al., 2020).

4.2.3. Waste management

Since AFSC firms need to devise proactive practices to enhance resource recovery from waste (Sgarbossa and Russo, 2017; Xia et al., 2016), they can use big data to produce a reliable analysis of the extensive misuse of AFSC resources and thereby reduce food waste (Kamble et al., 2020). Furthermore, by using big data, AFSCs can mitigate the waste of production inputs, such as soil, water, land, and foster environmental sustainability. The collaborative capabilities of big data applications are a foremost step toward the acceleration of effective waste management and disposal solutions (Sharma et al., 2020). In other words, increasing collaboration with big data solutions can optimize AFSCs, support effective food waste reduction strategies, and prevent food spoilage. Related to these points, Mishra and Singh (2018) submit that AFSC retailers can harness big data analytics to eliminate waste by considering consumer complaints made in retail stores or rely on social media data. Agri-food businesses can use big data to reduce resource waste throughout all the stages of the AFSC. The role of big data to reduce AFSC waste is highlighted in the study of Singh et al. (2018) who proposed a big data cloud-computing framework to help farmers in quantifying their carbon footprint more cheaply. While the carbon footprint of foods causes substantial GHG emissions annually, big data can be a promising technological tool for agri-food organizations to plan and develop waste prevention initiatives.

4.2.4. Traceability management

Advances in big data have the potential to reshape AFSC traceability, enabling agri-food organizations to verify the environmental stewardship traits throughout the whole AFSC from the farmer to the final consumer (Khanna et al., 2018). By incorporating big data in AFSC traceability systems, agri-food organizations would have the ability to enhance their process control, optimize the use of resources, and efficiently manage production. For instance, in the grain market, Jakku et al. (2019) suggest that big data applications could improve supply chain traceability and create value for consumers, retailers, processors, and growers. In the AFSC, the confluence of big data, the IoT, and blockchain can ensure higher levels of visibility,

transparency, traceability, authenticity, and quality of food products (Kamble et al., 2020). The automation of data collection, coupled with big data analytics, can significantly facilitate food traceability and shift AFSCs towards consumer-driven chains (Lioutas et al., 2019). The implementation of sensor-based technologies and big data analytics enables agri-food organizations to carefully control their AFSCs and trace any unsafe foods to their source. This increased food traceability may increase consumer willingness to pay for sustainable AFSC products (Khanna et al., 2018). As a result, big data has the potential to radically transform AFSCs and make them more data-driven supply chains, helping to achieve sustainable goals, efficient exchange of information, and effective decision-making processes. All of these benefits have been reported in the study of Kamble et al. (2020) who suggest that big data could facilitate traceability, shorten the whole AFSC, and serve deprived and poorer communities in the agri-food industry. Therefore, the integration of big data in the AFSC helps to forge a path towards agri-food sustainability. In many ways, big data supports the effective management of AFSC resources and processes, which represent a critical factor for successfully delivering higher yields at greater degrees of efficiencies (Ryan, 2020). Despite the many potentials of big data, several challenges lay ahead so far and inhibit the wide-scale shift of AFSCs to big data-based AFSCs. For the sake of brevity and balanced presentation of the topic under study, some challenges of big data in the context of AFSC are discussed in the upcoming section.

4.3. Challenges of big data in AFSCs

The integration of big data in AFSCs raises several issues for data analysis due to the complexity, variety, and heterogeneity of datasets (Villa-Henriksen et al., 2020). This implies that agri-food organizations need to use highly sophisticated and advanced data analytical techniques to be able to extract insightful information in the AFSC. The shift to big data-enabled AFSCs might expose agri-food organizations to the risk of lacking the necessary mechanisms and capabilities to symmetrically compete, afford the cost of big data infrastructure, and effectively make big data analysis (Lioutas and Charatsari, 2020). The poor technological infrastructure, the non-availability of resources, and the lack of skilled and talented professionals and data scientists (Eastwood et al., 2019; Kamilaris et al., 2017; Lioutas and Charatsari, 2020) might restrain the capabilities of big data in precision livestock farming (Ramirez et al., 2019). To effectively manage their AFSCs, agri-food organizations will be obliged to recruit highly knowledgeable data experts (Wolfert et al., 2017) for the analysis and management of AFSC data (Kamble et al., 2020). Therefore, agri-food organizations will have to commit additional financial resources to initiate big data investments (Reynolds et al., 2018) and to rejuvenate their current infrastructure so that data from a variety of on-farm systems, equipment, and records can be manageable (Ramirez et al., 2019). The lack of governance modes constitutes a barrier to big data adoption in the AFSC (Astill et al., 2020). Moreover, the transition towards big data-enabled AFSCs is not a simple task because the mechanisms of data governance, security, and legal compliance should be established in order to ensure data quality and integrity (Astill et al., 2020). Therefore, organizational, ethical, and legal arrangements of data sharing are unavoidable as they are imperative to improve collaboration and coordination between agri-food organizations and data scientists (van Evert et al., 2017).

5. CONCLUSION

This research employs an SLR method to obtain insights into the potentials of big data for sustainable AFSCs. The sustainability of AFSCs is a hot topic and an emerging research area with multi-disciplinary nature. The increasing trend in the number of articles at the intersection of big data, sustainability, and AFSCs confirms this tendency. The findings of the review point are summarized according to a framework that is abductively developed and which encapsulates the primary resources (i.e., soil, water) and processes (i.e., plant/crop management, livestock

management, waste management, traceability management) of AFSCs. Although this is not the first time the environmental impacts of AFSCs have been studied, our proposed framework showcases the role of big data to enhance sustainability, efficiency, and competitiveness for AFSCs. This framework highlights the role of big data for achieving sustainable AFSCs, the ones with a focus on food security, food safety, and environmental sustainability. While the environmental dimension of sustainable AFSCs currently revolves on the reduction of emissions, our study suggests that big data can be easily applied to enhance other environmental factors. For instance, the impact of big data on soil and water resources is substantial, and the technology can be considered to develop more comprehensive strategies for generally sustainable development. Increased awareness of the elements of the agri-food system, including climate, soil properties, and related agronomic parameters, is required. In spite of policymakers' interests, most AFSC stakeholders are more concerned with cost efficiencies than reduction of carbon footprints, and incentive barriers and technological limitations hinder the development of mitigation options in the agri-food industry (Smith et al., 2007). Nonetheless, through the integration of big data in the AFSC, this study submits that it would be possible for agri-food organizations to reduce the environmental impacts generated throughout the different stages of the AFSC. Not only that, they can empower the social aspects of the AFSC through ensuring food safety, food security, and the inclusiveness of small actors and farmers in the agri-food industry. Indeed, another goal of this study is to call for further investigation on how to promote more sustainable AFSCs with big data.

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BLACK BOX OF CSR: LITERATURE REVIEW

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ABSTRACT

Our study on Corporate Social Responsibility (CSR) literature reveales different gaps. The key questions here are: Is CSR ready for understanding? What are the gaps in CSR liretaure reviews? A literaure synthesis shows the heterogeneity of definitions, theories, and approaches of CSR. However, our study had some limitations in terms of time allocated for the study of literuature, as well as the limitation that most studies of CSR were conducted at orgganizational level, while very few were found at the individual or social level.This shows that CSR is a typical transdisciplinary problem space that can't be solved using mono discpline. The CSR decision-makers cognition and mindset have a huge influence on CSR engagement, but, no sufficient studies were conducted, in fact, it is considered as a black box. Though, we perceive it as a strength since it has defined the gap on which our further research and dissertation will be dedicated to solving the CSR decision-makers cognition and mindset, using the transdisciplinary approach.

Keywords: *Corporate Social Responsibility (CSR), Decision-Makers Mindset, Cognitive processes*

1. DEFINITION OF CSR IN LITERATURE

Several years ago, the company social concerns have been examined by scholars (e.g. Berle 1931; Bowen 1953; Davis 1960; Carroll 1993). CSR has a long and divers' history in literature (Carroll 1999). It has been a subject of research for 70 years (Whitehouse 2006). Yet, scholars have not reached to consensus definition for CSR. "One concern regarding CSR research is the lack of clarity with respect to its definition and the dimensionality of the construct" (Rowley and Berman 2000; McWilliam et al. 2006; cited in Yang et al. 2013). Defining CSR is complicated (Sheehy 2014 cited in Kumar et al. 2016). It does not have a paradigm of its own (Crane et al. 2008; Grafstorm and Windell 2011 cited in Kraus and Brtitzelmaier 2012; Preuss et al. 2009; Carroll 1979; Bhattacharya and Sen 2004; Crowther and Capaldi 2008 cited in Cook and He 2010). In addition, the definition has been varying in meaning and practice (Secchi 2007; Lee 2008; cited in Ismail 2009). Some scholars predicted that even in the future, there will no common CSR definition (Okoye 2009 cited in Kraus and Brtitzelmaier 2012). Crane et al. (2008, p. 5) state "few subjects in management arouse as much controversy and disputation as CSR". They also mention "fields of scholarship that CSR represents is a broad and diverse one, encompassing debates from many perspectives, disciplines, and ideological positions" (Crane et al. 2008, p. 7). Aguinis and Glavas (2012) conducted a literature review study based on 588 journal articles and 102 books and book chapters, they emphasize the fragmentation of CSR literature review in terms of level of analysis, and consider the reason for such fragmentation is due to: 1) CSR is often studied from one level of analysis at a time. 2) CSR is often studied at the macro level (institutions as well firms' level) while neglecting the micro level (individual level). They emphasize the urge for multilevel and multidisciplinary review that encompasses and synthesize the various CSR research in a full and comprehensive fashion (Aguinis and Glavas 2012).

The debate of CSR is traced back in 1930s when arguments of E. Merrick Dodd regarding the role of managers, indicating that they have social responsibilities toward societies. In 1953, CSR has been further conceptualized as a social obligation by Bowen (Taneja et al. 2011, p. 343), who had been identified as the "Father of corporate social responsibility" by (Carroll 1999, p. 270). Crane et al. (2008, p. 7) state that although CSR is lacking a well-defined paradigm, however, this should not be considered as a weakness, since CSR is still in an emerging status. Dahlsrud (2008, p.2) argued the phenomenon of biased definitions of CSR, and examined 37 definitions by five dimensions: stakeholder dimension, social dimension, economic dimension, voluntariness dimension and the environmental dimension. His results found that environment aspect of CSR has less attention and is used haphazardly in the 37 definitions. Hopkins (2007, p. 15) states that defining CSR is an essential issue, he defines CSR as "CSR is concerned with treating the stakeholders of the firm ethically or in a responsible manner". "ethically or responsible" indicates handling them and treating them in a way that is considered acceptable in civilized societies. Davis (1973) cited in Jamali and Keshishian (2008) defines CSR as "the firm's consideration of, and response to issues beyond the narrow economic, technical, and legal requirements of the firm …(that leads to accomplishment of) social benefits along with the traditional economic gains which firm seeks". Lantos (2001) cited in Jamali and Keshishian (2008) classify CSR as per the nature of the activities in to: 1) Obligatory versus voluntary, and 2) Purpose of company's activities, has benefit for shareholders, other stakeholders, or all. Vos (2003) defines CSR as "the obligations or duties of an organization to a specific system of stakeholders". Russell (2010, p. 44-50) provides a comprehensive overview on different definitions of CSR, arguing that there is only a general consensus among scholars on the core of the CSR idea, and that "social responsibility, according to these definitions, refers to idealistic views on organizations execution activities that protect and improve society's wellbeing beyond the extent required to serve the direct economic and technical interest of these organizations, thus the society at large". Russell (2010, p. 53-54) also discuss CSR definitions by businesses and society groups and concludes that efforts to identify CSR "are more practical, localised and more often focused on sustainability". Regarding sustainability, Marrewijk (2003, p. 101-102) states that CSR and corporate sustainability (CS) are synonyms, and defined both as: "In general, corporate sustainability and, CSR refer to company activities- voluntary by definition, demonstrating the inclusion of social and environmental concerns in business operation and in interactions with stakeholders". Blowfield and Murray (2008, p. 15) state that because of the several variables, it is not easy to clarify what mix of responsibilities a company will face Therefore, companies should not search for universal definition of CSR, instead they should plan their strategies around the perspective of their stakeholders. Despite the variety of views on CSR, specific CSR characteristics are identified. As most agree that CSR is compatible with profit-making and fulfilling societal demands (Doane 2004a). As Vogel (2005, p. 19) states "virtually all contemporary writing on CSR emphasizes its link to corporate profitability". In addition, contemporary views of CSR practices highlight the voluntary aspect of it that goes beyond what imposed by legislative norms (e.g. Carroll 1979; Davis 1973; McWilliams and Siegel 2001). Even more, CSR can be viewed as an initiative that encourage self-regulation of business as a substitute for state regulation (Albareda 2008; Crane et al. 2008; Zadek 2001). Based on the literature review, we understand the existence of different CSR definitions, such definitions hold the core idea of CSR, which is the social responsibility of organizations to protect and improve the well-being of the society, beyond their direct economic interest. Some scholars argue that there will be no universal definition of CSR, and firms should plan their CSR strategies around the perspective of their own stakeholders. More research is encouraged to cover this gap.

2. OVERLAPPING TERMS

With the increasing recognition of CSR concept, several overlapping terms and concepts emerged, for example, sustainability, social accountability, corporate citizenship, corporate responsiveness, business ethics and corporate social performance (Lozano 2013). However, comprehensive, and commonly accepted definition of these terms and concepts have not been established yet. Therefore, CSR can be considered as a starting point for these overlapping terms, as they embrace the CSR logic into them and can be viewed as another approach of framing the CSR (Grafstrom and Windell 2011, p. 221). We believe that CSR is still an emerging field, and there is a need for further research to identify commonalities and differences between these terms.

3. CSR PRACTICES

CSR is considered as perception oriented, thus, its' practices may differ in every society (Wether and Chandler 2006 cited Kraus and Brtitzelmaier 2012); Husted and De Jesus Salazar 2006; McWilliams et al. 2006 cited in Fenwick and Beirema 2008), due to cultural differences and the relative importance of certain practice to such society which is affected by the availability and absence of such resources, for example; finance, organization size, traditions, as well as societal position toward various issues (Yang et al. 2013). Its practice may even differ in each industry (Tuzzolino and Armadi 1981). The CSR practice can be categorized into seven categories: environmental sustainability, enhancing local community well-being, promoting rights of employees and suppliers, competitors or customers, transparent and honest accountability, legal and honest operations, and global citizenship to promote social and environmental justice (Crowther and Rayman-Bacchus 2004; Hopkins 2003; cited in Fenwick and Bierema 2008). Organizational responsibilities and duties toward their society are social, economic, and environmental (Enderle 2004 cited in Yang et al. (2013), as the triple bottom line of an organization (Porter and Kramer 2006 cited in Yang et al. 2013; Davis and Crane 2010). According to L'Etang (1995), there are three CSR classification for practical guidance: 1) Direct responsibility: it refers to responsibilities and duties included in the company's mission, culture, objectives, and issues related to well-being of employees. The scope of which decision-making is shared and advanced would affect which CSR can be recognized to the company (as a whole). 2) Indirect responsibility: it comes from the company's position in the society, which is difficult to define, for example; with the respect to environment, it is challenging to localize CSR, as environmental effects do not recognize national boundaries. 3) Corporate philanthropy: it is not CSR, as it is performed because of perceiving it as a good act. We understand that CSR is viewed as perception-oriented, thus, its practices may differ from one society to another according to the cultural differences and the relative importance of the practice to its society. Some scholars support the fact that no universal practice can be reached. Others argue that it is a challenging issue to localization CSR practices. Thus, we suggest more research on this topic to cover this gap in CSR literature review.

4. FRAMEWORKS AND THEORIES

Another evidence of CSR fragmentation, and its focus on one level of analysis at a time, is the existence of different CSR theories. For example, scholars researching CSR at the institutional level of analysis, often use institutional theory. Others studying the CSR at the organizational level, tend to use different theories, such as resource-based view of the firm. Whilst scholars studying CSR at the individual level, often tend to use different theoretical frameworks such as organizational justice, and social influence theories (Aguinis and Glavas 2012). Gray, Owen, and Adams (2010, p. 6), define theory as "Theory is, at its simplest, a conception of relationship between things. It refers to a mental state or framework and, as a result, determines, inter alia, how we look at things, how we perceive things, what things we see as being joined to other

things and what we see as good and what we see as bad". However, a combination of interrelated concepts is considered a theoretical framework which may contain a single theory or a collection of several theories (Collis and Hussey 2009; An et al. 2011). The literature review shows that firms, are increasingly adopting CSR, although no commonly agreed theoretical perspective exists in explaining firm's behaviour in connection to CSR practices, and there is several variation in theoretical perspectives that have been applied (Gray et al. 1995a; Deegan et al. 2002; Belal 2008; Gray et al. 2010). The CSR discipline is a highly complex one, thus, no single theory can explain it. Gray et al. (2010, p. 9) state that "we tend to assume that theory is always incomplete in social sciences", they also emphasize that the existing of several theories should be seen as complementary to each others, rather than competing. Several theoretical perspectives emerged to clarify the firm's adoption of CSR (McWilliams et al. 2006). According to Ismail (2009), there are three classification for CSR theories:

a) The Utilitarian Theory: Firm's aim is economic in nature, and they perform CSR activities with the focus on local community, such acts are related to competitive strategy (Friedman, 1970). The classification of this theory goes under "social cost" of the organization as well as "functionalism". The social cost refers to the non-economic factors that affect the socioeconomic factors of the local community. Functionalism refers that the organization is part of the economy with the objective of making profit (Porter and kramer 2002; Litz 1996).
b) The Managerial Theory: External elements are considered in this theory. It is classified into corporate social performance (CSP), Social Accountability Auditing and Reporting (SAAR), and Social Responsibility for multinationals. It is about measuring the economic impact of socially responsible activities (Garriga and Mele 2004; Wood and Logsdon 2002; Detomasi 2008).
c) The Relational Theory: It is based on the relation between the business and its environment and categorized into 1) Business and society: viewing business as part of its environment, thus has obligations toward it. 2) Stakeholder approach: managers need to balance the need of their stakeholders. 3) Corporate citizenship: it is related to local community. 4) Social contract: the economic act of the business must be ethical in nature (Garriga and Mele's 2004).

Based on the literature review above, we understand the existence of different CSR theories and frameworks. The CSR discipline a highly complex discipline. Some scholars advocate that no single theory can explain the full discipline in a comprehensive fashion. Others call for a comprehensive theoretical framework that encompasses all CSR disciplines. Thus, it is a good opportunity for further future study and research to cover this gap in CSR literature review.

5. MOTIVES FOR CSR

Previously, CSR was perceived as a tool of managing reputation, and was viewed as voluntary act (Waddock 2004; Googins et al. 2008; cited in Lavine 2012). However, the perception has evolved, and CSR is seen as adding value to the company, therefore, strategic CSR came into place (Lavine 2012). Studies have proved that CSR practices benefit the firms by increasing return on stocks (Cornell and Shapiro 1987 cited in Edmans 2012). The employee welfare dimension of CSR improves stock returns (Edmans 2012). Bragdon and Marlin 1972; Parket and Eilbirt 1975; Cochran and Wook 1984; McGuire et al. 1988 cited in Edmans (2012) observe positive relation between CSR and company's accounting performance. Roman et al. 1999; Margolis and Walsh 2003 cited in Edmans (2012) found that most studies result a positive relationship between CSR and finance performance of a firm, also CSR increase job satisfaction of employees and promote citizenship attitude (Organ 1988 cited in Edmans 2012).

It contributes not just, in attracting, but also in retaining high quality employees (Greening and Turban 2002; Greening and Turban 1997; cited in Edmans 2012). Thus, we can say that the main objective is to make the adoption of CSR practice more attractive to managers (King and Toffel 2009). Illustrating that adoption of CSR may be beneficial for them and contribute to help the managers to understand why they need to pay attention to social and environmental concerns, while, also it presents the CSR as a topic that add to shareholders value, or at least not decreasing it (Blowfield and Murray 2008). Nevertheless, reverse causality in such studies has been debatable (Waddock and Graves 1997; Orlitzky et al. 2003; cited in Edmans 2012). Suggestions have been raised to further study the causality issue (Cochran and Wood 1984 cited in Edmans 2012). The literature is largely split between approaches that consider CSR as externally driven, or internally driven, or a mix of both at the same time. No firm conclusion has been reached yet (Muller and Kolk 2010).

5.1. External Motives

Several studies highlighting the influence of external factors, which motivate firms to adopt CSR practices. Muller and Kolk (2010) emphasize the link between external pressure as shareholders demands, regulations or peers' pressure and adoption of CSR practices. For example, (Deegan et al. 2002) indicate a positive relationship between media attention and firm's social and environmental actions. The role of government is considered a substantial driver for firm's engaging with CSR. According to (Aguilera et al. 2007; Moon and Vogel 2008) governments motivate firms to be socially responsible through: First, enforcement of laws supporting adoption of CSR. Second, endorsement, this could be for example, through governments attempts in raising business awareness to deal with specific CSR matters that the government is incapable to deal with, thus, endorse the firms to do so. Third, guidance, where governments offer supporting several self-regulatory tools to facilitate the implementation of CSR by firms. Finally, partnering, such cases when government inter into partnership with businesses to fulfil CSR matters (Bartley 2003; Darnall and Edwards Jr 2006; Delmas and Toffel 2003; Jiang and Bansal 2003; Waddock et al. 2002; Weaver et al. 1999).

5.2. Internal Motives

Some scholars perceive that firms voluntarily adopt CSR practices to facilitate opportunistic rather than responsible act (Campbell 2007; Lenox 2006). Others view that firms adopt CSR as a signal of superior performance over their competitors (Campbell 2007; Lenox 2006), and as a sign to secure legitimacy and competitive advantage. Some scholars argue that firms engage in CSR to be able to satisfy their own benefits, including reputation enhancement; avoid costs stemming from litigation; attract investors; improve their competitiveness and market positioning; as well as improve their operational efficiency (Bansal and Hunter 2003; Waddock and Graves 1997). While others argue that firms engage in CSR because of obligations and sense of responsibility that they develop, and not for economic reason (Davis et al. 1997; Heugens et al. 2008).

5.3. Combining Internal and External Motives

Some scholars like Husted and Salazar (2006), identify three categories for motives: a) Strategic CSR, its when firms expecting economic returns from engaging into CSR practices. b) Coerced egoism, its when firms engage in CSR because being compelled by regulations to act so. c) Altruism, its when firms engage in CSR because they believe in it, and believe it is the right thing to do. Weaver et al. (1999) argue that CSR engagement is influenced by both external expectations of legitimacy and top management commitments to ethics as well as to financial, operational, and strategic concerns.

We understand from the review, that no solid conclusion has been reached regarding the CSR motives, is it externally driven? Internally driven? Or a combination of both? Another literature gap is identified here. The reverse causality between shareholders value and the existence of CSR practices is also another gap in CSR literature. We believe such gaps in the literature review need further study and research.

6. DECISION-MAKERS COGNITION

The managerial cognition referes to the capacity and tendency to coduct thorough analytical details using the intuitive processing strategies (Hodgkinson and Clarke 2004), and refers to the ability to process complex information by performing analytical thinking, including the ability to switch from past experience to present situation (Messick 1984). Each person uses different ways to process information. Lewis (2002) states that each strategic decision-maker choose approaches depented on his circumstances, objectives and personal preferences, and his decision is consrained by societal, sectoral, environmental and organizational factors. Thus, if strategiest choose the appraoch depending on their personal circumstance, this suggests that strategic thinking is a concious individual mental process. Hodgkinson and Sparrow (2002) expalain that the decision-making process has two complementary processes: 1) A largely automatic , pre-conscoius process that includes developing and using heuristics (based on past expeince); and 2) A deeper, more effortful process that includes detailed analysis. Thus, people construct meanings and make sense by establishing mental representations that direct their thinking and ultimately their decisions (Rumelhart and Norman 1985). This reveal how strategiest decisions often reflect their personal views that is formulated upon their past experience, it is called as reasoning by analogy (Jarzabkowski and Seidl 2007), which is subject to biases, since complex problems being based on personal past expeirences (Hambrick and Frederickson 2001).

6.1. Individual and Corporate Values

Schwartz (1992, p. 2) defines values as “desirable states, objects, goals or behaviours transcending specific situations and applied as normative standaards to judge and choose among alternative modes of behavoiur”. Values, are seen as strong informal regulatory guids during the decision-making, that influence individuals as well as manegerial cognition. For example, values determain modes of behaviour that are socially acceptable and act as normative regulatory guid for individuals (Meglino and Ravlin 1998). Pech and Durden (2003) illustrate that decisions are normally filtered through attitudes, beliefs and values; where poor decision-making happenes when filtering of information conflicts with individual perceptions and values. Thus, resulting in poor evaluationa and assessment. In a study made by Gallen (2006) on 70 managers, he found that managers cognitive style and values affect the strategies they preferred. Therefore, strategy is linked to strategist’s view of how firms should operate and fuction (Hambrick and Mason 2001; Pant 1998). Given that managerial cognition influences decisoin-making and competitive strategies, hence, the congnitive side of strategist is a key to our understanding of how competitive organizations are developed (Buksar 1999). Personal values are part of the decision-making processes whether the person notice it or not, hence, it is essential to understand how values affect participation in CSR. We understand from the review that managers cognitive style and values affect the strategies they preferred, and influnce their decisions, thus, we believe that understanding their cognitive style and values would enhance the overall performance of the firms and positively affect their competitive positions.

6.2. CSR Mindset

A mindset has several terms as cognitive structure, cognitive filter, mental model, and cognitive framework, all can be as an abstract model comprising of conceptual structure for symbolizing

the knowledge and sets of processes that work on those structures (Aitkenhead and Slack 1985). A person's mindset influences the process of attention (i.e. information acquisition) through focusing his attention on selective aspects of the surroundings, interpretations, sensemaking (information perception, interpretation, assimilation, as well as comprehension), decision-making, and action (Daft and Weick 1984). The cognitive side of CSR and the CSR mindset of managers, is still in need for investigation to be understood, some scholars argue that the reason for this is that the term CSR is not considered at the personal/individual level (Secchi 2009). Others relate it to considering the cognitive structure of CSR is conceptualized as a one-dimensional form that is connected to managerial values (Waddock and Graves 1997; Hemingway and Maclagan 2004). According to Hay and Gray (1974) study on conceptualization of CSR, they considered managerial behaviours toward CSR are characterized by number of values and are categorized into three categories: the profit-maximization manager, the trusteeship manager, and the quality of life manager. Nevertheless, it is more reasonable to conceptualize CSR mindset from a multi-dimensional perspective. Boal and Peery (1985) identified three conceptually distinctive cognitive dimensions of CSR: 1) economic/market values vs, non-economic/human values (this was the most important dimension), 2) ethics, and 3) consequences for relevant interest group. The multidimensional attitudes of CSR have been further confirmed by Waldman et al. (2006) study of the values of top management in 15 countries, where they identify CSR dimensions as: 1) shareholder/owner, 2) broader stakeholder relations (responsibility toward non-financial stakeholders, such as employees and consumers groups), and 3) community state welfare (responsibilities for the larger societal group beyond the immediate stakeholder groups). Secchi (2009) also believes in conceptualizing CSR mindset as a multidimensional one that consists of economic and non-economic dimensions. In Aguinis and Glavas (2012) literature review of CSR at individual level, they find that managers' assertiveness on CSR values is linked with employees' view of visionary leadership, that is positively encouraging employees to perform better, thus, affecting the firm performance positively. They also find that several normative incentives affect conducting CSR activities, such as being consistence with individual's values and concerns, thus, if both are on the same track (normative incentives as well as individual values and concerns) that is a strong indication of person's engagement in CSR. Abugre and Nyuur (2015) state that managers are the role model within the firms, they infuse the corporate values to the employees, and when senior managers express commitments to such values, this attitude is usually spread all over the firm to all levels (Hawkins 2006). This is emphasized by the statement of Abugre and Nyuur (2015, p. 166) "Today, organizations cannot survive or prosper without members behaving as good citizens by engaging in positive organization-relevant behaviour associated with CSR. Corporate social responsibility is a critical emerging issue in organization management". Hence, managers have a role in identifying and demonstrating behaviours that encourage as well as advance CSR in the firms. The research on CSR considered management mindset and the potential impact of managerial values and attitudes toward CSR as the main driving forces in directing the firms toward socially responsible targets (Swanson 2008). William and Aguilera (2008) also emphasize that managerial values towards CSR will possibly affect on organizational level decisions. Hay and Gray (1974) argue that CSR managerial mindset can be affected by the individual manager's own system of core beliefs and values, where the content of individual manager's CSR mindset in terms of information, knowledges are usually processed and stored. According to Aguilera et al. (2007) study, they argue that managerial values and attitudes towards CSR are not the same in all countries, rather, they vary across countries due to different local norms, social institutional constraints, and the level of industrialization in each country. Thus, the content of individual manager's CSR mindset may vary due to differences between individuals and across cultures (Steinbruner 1974; Walsh 1995).

We realize from the literature review that CSR is a critical emerging issue in organization management, and the cognitive side of CSR and the CSR mindset of managers, is still in need for more research, since it has not been investigated sufficiently. Some scholars argue that the reason for such gap in literature review, is that the term CSR has been neglected at the personal/individual level, and advocate to be investigated as a multidimensional discipline that consists of economic and non-economic dimensions. Therefore, we believe more studies and research should focus on this essential topic to bridge the existing gap in CSR literature review.

7. RESEARCH GAP

A research gap refers to having available knowledge, while missing needed knowledge to bridge the gap in the literature. In our study we find that the managerial decision-making process in CSR is considered as a black box. the decision-makers cognitive side and mindset is still in need for more research and study since it has not been studied sufficiently (Wang et al. 2015). Financial benefits as profit maximization and other non-financial benefits such as talent management (Bhattacharya et al. 2008), risk aversion (Kytle and Singh 2005), as well as brand differentiation (Paluszek 2005), have mentioned as incentives for managers to engage in social responsibility (Waldman et al. 2004), such studies contributed toward conceptualization of CSR, while there is little research on the influence of managerial attitude toward CSR, and regarding the role of senior management in CSR practice. Waldman et al. (2004, p. 4) state that the existing views and models of CSR "do not take into account the personal attributes or qualities of senior managers which may affect the extent to which firms engage in CSR". Several scholars mentioned the lack of research on organizational and managerial perspective of CSR (Maak and Pless 2009; Metcalfe and Sayed 2012).

8. FINDING

Our study on CSR literature proves the heterogeneity, transdisciplinary, and fragmentation of CSR, which provide golden opportunities for further future research. We conclude that there is a problem lies in the research of CSR, as our finding proves that CSR has not been investigated at a transdisciplinary level of approach. Most articles were covering the CSR at the organizational level, but not at the individual or social level. The managerial decision-making is based on the consideration of where the firm has been in the past, where it is currently now, and how it endure and compete in a dynamic atmosphere in the future. In our study, we find that the decision-makers cognition and mindset have a huge influence on CSR engagement. Nevertheless, no sufficient studies covering this essential topic were found. The novelty of my research is that I would like to conduct my dissertation using the transdisciplinary approach in solving the CSR decision-markers cognition and mindset, to bridge the gap in CSR literature in this particular problem that we discovered.

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DEPLOYING LEAN TRANSFORMATION IN SERVICES: AN ENTERPRISE-LEVEL CONCEPTUAL FRAMEWORK

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ABSTRACT
By deploying lean transformation at enterprise-level, many manufacturing organizations have gained significant financial and cultural competitive advantages. Following their manufacturing counterparts, some service organizations have started adopting lean. Since then, studies about application of lean in service processes have become a crowded space in academic journals, however, attention on enterprise-level lean transformation in services from academia is unsatisfactory. This paper reviews note-worthy literature on lean to surface this research gap and proposes a conceptual framework for lean transformation in services.
Keywords: *Lean services, lean transformation in services, enterprise lean transformation, lean maturity*

1. INTRODUCTION

Toyota Corporation over half-a-dozen of decades of practicing Toyota Production System (TPS), has out-smarted and out-performed its nearest competition by a considerable margin (Womack et el, 1990). Since the introduction of Toyota insights (lean) in 1988 by Ohno and expanded in 1990 by Womack et el, the contribution lean has made to the performance improvement of different industries is immense (Liker, 2004, Krafcik, 1988, Slack, Lewis and Bates, 2004, Pilkington and Fitzgerald, 2006). With increased understanding of lean as an enterprise management philosophy (Liker, 2004 and Womack and Jones, 2005), practicing lean enterprises have been able to gain not only financial but also multi-dimensional gains including significantly reduced customer returns and reduced employee grievances (Sim and Banerjee, 2015). Womack et el (1990), defines lean as "Fusion of mass and craft production consisting of set of principles and best practices aiming at continuous improvement" and Shah and Ward (2003) defines lean as "an integrated system consisting of inter-related elements and management practices aimed at delivering value to customers". For this paper, these two definitions are chosen as the basis of viewing 'lean' as they both represent a holistic enterprise view covering aspects beyond narrow 'waste elimination. Approximately within the past two decades, service sector organizations have started adopting lean management principles within their processes, work systems and in the organizational behavior, and these organizations have gained similar financial as well as cultural benefits in comparison to their manufacturing counterparts (Liker and Morgan, 2006 and Liker and Ross, 2017, McKinsey & Company Publications, 2014). Apart from this, the amateur argument of increasing customer value and financial gains as 'conflicting priorities of lean in services' has been proven a myth by credible research (Carlborg et el, 2013). Global development indicators show that the services sector has accounted to almost 71% of global GDP in 2016 and this growth is faster than in 1980s and 90s (World Bank national accounts data, 2017). This shows the commercial significance of improved productivity and effectiveness of the service sectors which calls for greater demand for application of lean from an impact point of view. However, even with such magnitude of global significance, the quantity and quality of academic research dedicated to understanding lean transformations within service sector is unsatisfactory. Transformational lean deployments in services is rare, however, few medium to large service corporations have done it over the part 15 years and gained significant benefits (McKinsey & Company Publications, 2014) and these programs have not been exposed sufficiently within academic research.

The need of a framework to academically decode these real-life success stories, is established through this paper. The term 'Enterprise-level' is used throughout the paper, and it refers to the inclusion of all organizational sub-systems such as processes, technology, management systems and organizational behaviors.

2. LITERATURE REVIEW

The literature review consists of two parts. The first, examines application and understanding of lean in manufacturing, services and lean as an enterprise management philosophy. The second, explores literature on deploying lean transformation at enterprise level and management of enterprise level change.

2.1. Literature on exploring understanding of lean

Since first insights of 'Toyota Production System' was exposed to the rest of the world through Ohno (1988) and then more elaborately by 'Machine that Changed the World' (Womack et el, 1990), various efforts have been made to deepen the knowledge on 'lean'. 'How lean evolved' is not within the scope of this paper and for the purpose of establishing the targeted knowledge gap, the literature is classified based on sub-domains of content. There are three subgroups of content themes within this section of literature. First, representing selected note-worthy publications dominantly intended to explore lean concepts, tools, and solutions. Within this domain most of the early publications have attempted to understand tools and processes of Toyota Production System (Figure 1 - A). Second domain looks at lean as an organization, a system of working, a culture and having an enterprise view (Figure 1 - B). Third, extension of lean knowledge in the services domain with some publications exploring specific service niches deeper (Figure 1, C1 and C2).

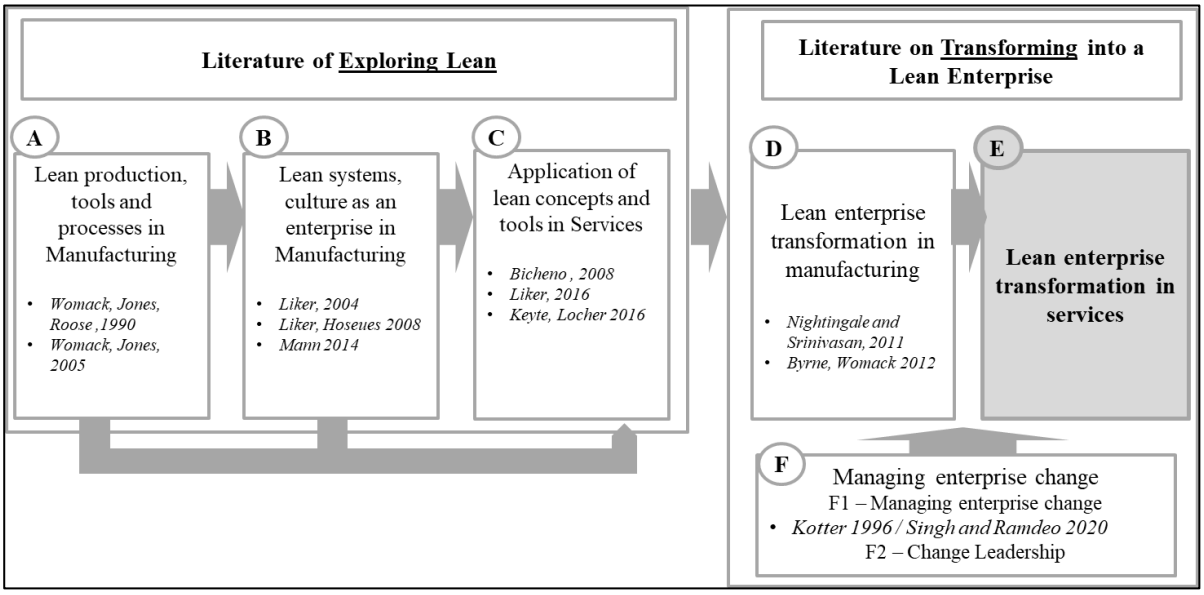

Figure 1: Thematic clusters of lean literature

2.1.1. Literature on lean production, tools in manufacturing ((A) in figure 1)

Literature within this category are dominantly intended on exploration of lean tools, concepts, and application within manufacturing contexts. Most of the early works of lean exploration were carried out with direct reference to Toyota Corporation and early adopters within the manufacturing industries (Stone, 2012). Ohno (1988) and Womack et el (1990) provided the initial momentum and raised the academic curiosity towards the mechanics behind Toyota's success.

TPS (Toyota Production System) exposed by both these publications revealed mainly the process and process management mechanics of TPS and addressed the comparative advantages over the mass production model of General Motors. Womack et al (1990) also suggests possible application of TPS techniques in non-manufacturing industries such as healthcare and retail distribution. Later, Womack and Jones (2003) take understanding of TPS to a perspective broader than process management, establish the term 'lean' firmly as a direct representation of TPS and introduces 5 core principles; namely, value, value creating steps, value stream, pull by customer demand and continuous strive towards perfection (Womack and Jones, 2003). Womack and Jones (2015) take lean process point of view a further step forward by introducing customer experience mapping as a lean tool to diagnose an existing process and find solutions to fix issues from a customer point of view (Womack and Jones, 2015). Within the lean knowledge in manufacturing contexts, these publications constitute bulk of the knowledge, and most other studies have attempted testing or deep diving into the concepts which are already revealed within these landmark literatures.

2.1.2. Literature of lean as a system, culture, and a way of working in manufacturing context ((B) of figure 1)

Literature within this domain takes an enterprise view and investigates broader organizational aspects such as culture, behaviors, interdepdant systems and looks at lean at an enterprise level. Attempts in decoding lean principles of Toyota have not been frequent in academic or mainstream research. With an attempt to interpret principles behind a lean system, Spear and Bowen (1999) and Spear (1999) introduced four principles; task specification, streamlined communication, simple process architecture and hypothesis-driven problem solving. However, the works of Spear and Bowen (1999) and Spear (1999) lacked the enterprise level holisticness in identifying principles of lean. Introduction of 14 principles of a lean enterprise by Jeffrey Liker expanded conceptual horizons of Toyota Production into Toyota Way (Liker 2004). Principles such as, having a long-term management philosophy, root-cause problem solving, work-load leveling, standard tasks at all levels of the hierarchy, having visual controls, leaders performing 'gemba' (go see where the problem is), developing leaders and capable front-line employees etc. provided a broader view of a lean enterprise (Liker, 2004). Liker and Hoseues (2008) consolidated Toyota Way within 4 key pillars where the 14 principles are embedded in, which are, problem solving, people and systems, process, and philosophy (Liker and Hoseues, 2008). 'Creating a Lean Culture' (Mann, 2014), reviews at a granular level on how these principles could be lived on a day–to-day level as behaviors of organizational culture. Primarily using manufacturing environments as context, the author describes pillars of a lean management system as, standard works for leaders, visual controls, daily accountability system, and problem solving. Mike Rother, in his work on 'creation of a sustainable lean culture', shows importance of management routines (Rother, 2010) and argues that sustainable results can only be achieved by continuously practiced behavior routines or 'Katas'. Another important dimension within lean-enterprise domain of knowledge is lean leadership (expansion of one of the principles out of 14 (Liker, 2004). Liker (2011) introduces Toyota Way lean leadership model that includes 4 key aspects of leadership which are, commitment to self-development, coach and develop others, support daily kaizen and creating vision and aligning goals (Liker, 2011). Building on Liker (2011), Dombrowski and Mielke (2013, 2014) discuss their own 15 principles of lean leadership mapped within lean concepts namely, improvement culture, self-development, qualification, gemba, and hoshin kanri. Most of the literature within this domain addresses holistic lean enterprise aspects within manufacturing industries with little reference to services.

2.1.3. Literature on application of lean in service processes ((C) of figure 1)

Primary intent of literature within this domain is the exploration of application of lean within services, and they belong to two categories, one, literature exploring application of lean in services industries and two, literature exploring application of lean in specific service industry niches. Early days of 'lean in services' literature mostly attempted clearing doubts and testing of possibilities of lean application in services. Eventually some literature emerged with examples and cases of complete lean process application in services. Bicheno (2008), showed how lean in service could be in principle the same, yet in practice need different lenses of prioritization in focus of application. Ahlstrom (2004), attempts directly translating lean in manufacturing to lean in services and proves that such translation as logical and applicable within the service industries if contingencies are taken care of (Ahlstrom, 2004). Ahlstrom (2004) goes on to conclude the importance of understanding principle similarities between manufacturing and services rather than letting the differences limit the meaningful application of lean concepts in services (Ahlstrom, 2004). Expanding Toyota production system and Toyota Way thinking, Liker et el (2006) outline and illustrate the principles of TPS that can be applied not only in manufacturing but in any technical or service process. Liker et el (2006), take a systems approach to explain how the integration can happen between people, processes, and technology of a service organization. Liker et el (2006) also claim that the adoption of the principles should happen as a continual, comprehensive and a coordinated approach to create change-learning for the entire service organization. Liker et el (2006) provide examples of how TPS has been replicated in some of the service-based industries, however they do not provide a roadmap of lean transformation towards becoming a matured lean service enterprise. Liker extends the work on Toyota way principles (philosophy, process, people, and problem solving) directly into services industry through 'Toyota way to Service excellence' (Liker, 2016). Taking Toyota Way pillars a step forward with practical lessons learnt, Sarkar (2012), shares 53 ideas on implementation of lean within services. These ideas take the form of practice routines and author keeps it relevant to services industry, while using the framework of Toyota culture. In another note-worthy attempt of lean in services is the value stream approach for services (Keyte and Locher, 2016) where the author extensively elaborates service value streams and management systems diagnosis methods for service performance to be improved. When it comes to literature exploring application of lean in specific service niches, Apte and Goh (2004), examines lean in insurance which is an information intensive service environment and suggests modifications to the manufacturing lean principles. For example, due to the absence of inventory, reduction of cycle time should be treated as a priority (Apte and Goh, 2004). Allway and Corbett (2002) using a case study demonstrates how successful outcomes have been achieved using lean in insurance processes. Allway and Corbett (2002) claim that principles as in manufacturing industry could be equally applied in service specific processes and gain similarly impressive benefits (Allway and Corbett, 2002). Piercy and Rich (2009) attempts to assess success of lean in call center operations and reveals how significant improvements in quality and cost positions have been achieved with minimal investment in adoption of lean (Piercy and Rich, 2009). Gonzalez-Rivas and Larsson (2011) extensively elaborate the nature of waste exist in knowledge worker processes and environments by drawing parallels with principles from lean manufacturing schools. Content of Gonzalez-Rivas and Larsson (2011) is less about launching and program management of end-to-end deployment of lean in work environments with knowledge workers but examine concepts such as best practices adoption, process engineering, sustainability, visual management, and lean team formation. 'Lean IT' by Bell and Orzen (2010); extensively review how lean could be applied in areas such as integration of lean IT with various organizational sub-functions and IT operational excellence. Other than Bell and Orzen (2010), multiple other attempts have been made to understand lean within knowledge-worker or IT based organizations (e.g. Staatsa et el

2011). Asif et. el. (2015) claim that the challenges of implementing lean within information intense processes and industries are not yet fully understood. They elaborate how application of some of the waste reduction principles of lean thinking might be challenging in application within services and when some of the wastes when eliminated, trigger increment of other types of waste and vice versa (Asif et el 2015).

2.2. Literature on enterprise lean transformation

Literature within (D), (E) and (F) on figure 1 primarily address the 'how' of taking a non-lean organization towards lean. They address roadmaps, approaches of lean deployment and managing change. The literature uses manufacturing as the context and considers change at enterprise level. With the enterprise view implying organizational transformation, research in lean has evolved into a broader transdisciplinary domain bridging strategic management, organizational behavior, and operations management (Forza 1996, Emiliani, 1998 and Atkinson, 2010).

2.2.1. Literature on lean transformation in manufacturing ((D) of figure 1)

Literature within this domain focus on the implementation/deployment aspects of lean within manufacturing contexts. Henderson and Larco (1999) extensively goes through implementation of lean in manufacturing and procedural routines of a lean enterprise, though defines 'enterprise' from a narrower scope compared to the authors from post 2000 era such as Byrne and Womack (2012) and Nightingale and Srinivasan (2011). 'The going Lean' (Ruffa, 2008) explores how contextual differences between organizations can make the nature of the lean journey different and examines pillars of a lean change journey such as, having a case for change, structuring lean dynamics, transforming from the top, and creating sustainable excellence. Nightingale and Srinivasan (2011) focus on transformation programs catered for manufacturing industry and propose an actionable transformation plan based on cases covering different management systems. Nightingale and Srinivasan (2011) also organize their observations within a set of lean principles of transformation which includes lean lenses such as process, performance, and people (Nightingale and Srinivasan, 2011). Covering deployment challenges, Jadhav et el (2014) reveals 24 lean barriers and argue that the lean implementation will not be a full success with reliance on tools and techniques alone, but also on the top managements' engagement, employees' attitude and prevailing culture within the organization. Transformation perspective of lean enterprise implies a status of 'leanness' present in an organization and achieving a target 'leanness' status. Leanness is the extent to which the lean philosophy has been adopted by the organization and several research attempts have been made to give clarity to this point of view. Karlsson and Ahlstrom (1996) uses a collection of measures in the form of a checklist, McIvor (2001) and Soriano-Meier and Forrester (2002) measures leanness by use of a set of variables such as production cost, quality and lean supply chain. Radnor and Boaden (2004) argues that measurement of leanness is context-dependent, and it is based on the needs of each organization. However, these measures only look at outcomes of lean and not the leanness of the enterprise behavior, hence with limited applicability within a transformation framework. Tightly related to transformation, another perspective similar to 'leanness' is lean maturity. Although not a crowded academic space, there are a few note-worthy researches related to lean maturity (e.g. Nightingale and Mize, 2002, Sánchez and Pérez, 2001, Nesensohn et al, 2014, Donovan, 2015, Ray et al, 2006 and Urban, 2015). These maturity models, unlike the research on 'leanness' have attempted to focus on organizational aspects of a lean enterprise instead of outcomes such as cost efficiency. However, only the maturity assessment model of Urban (2015) keeps it applicable within any industry while all the other models focus on either manufacturing or construction industries.

Urban measures lean maturity using the dimensions organization's leadership associated with the value stream, operational improvement, people treatment and lean results obtained (Urban, 2015).

2.2.2. Literature on lean transformation in services ((E) of figure 1)

Literature within this domain addresses the 'how' question of taking a non-lean service organization towards lean. They primarily address approaches of implementation and managing change. The domain of holistic transformation approaches of a service organization from non-lean to lean, has considerably limited academic or mainstream literature. Toyota Way to Service Excellence (Liker, 2016), provides a view on how each of the 14 lean enterprise principle (Liker, 2004), could look in a lean service and how each principle could be implemented. However, Liker (2016) does not show how an enterprise at holistic level could drive change from non-lean to lean by looking at interdependencies, managing change, and related holistic organizational elements. Bell and Orzen (2010), address some of the lean service transformation aspects such as having a structured program, leadership in change, strategy, planning, creation of a lean change team etc. Although the authors cover some of these aspects related to managing transformation, the scope is not from an enterprise point-of-view but from a functional point-of-view. Similarly, Gonzalez-Rivas and Larsson (2011) keeps it narrowly within the functional scope and less expanded to the holistic enterprise level. Within the view of driving lean transformation in healthcare industry, Dean (2013) proposes a lean enterprise transformation approach which covers transformational elements such as lean transformation process, senior leadership team, transformation using value stream model, designing governance of implementation, planning and execution of a lean summit, results assurance and managing sustainability, current state analysis, future state design, and deploying rapid improvement events (Dean, 2013). Keyte and Locher (2016) discuss how lean transformation could be implemented using value stream approach, though they do not cover aspects such as driving lean behavioral changes, strategic program management of change and governance as Dean (2013) does.

2.2.3. Literature on managing enterprise change ((F) of figure 1)

Literature within this domain is independent from lean related themes and address angles of driving change within an organization and its culture. With the assumption that a lean transformation requires a systematic approach to change an organization in its many different aspects including organizational culture, this domain reviews note-worthy publications related to change management of an enterprise.

2.2.3.1 (F1) of figure 1: Managing organizational changes and changing organizational culture

Van de Ven and Sun (2011) explore the common breakdowns in implementation of four main change process models, namely, planned change, regulated change, conflictive change, and competitive change. Greenwood and Hinings (1996) take a neo-institutional theoretical perspective, and as the principle theoretical issue, address the interaction of organizational context and the action taken by the organization itself as critical elements. Greenwood and Hinings (1996) also argue within process view by stating that the individual organizations retain, adopt and discard templates of change within the conditional institutionalized nature of the organization's multiple fields. Cameron and Robert (2011), explores changing organizational culture using the value framework and provide ways in which understanding and changing organizational culture to make an organization more effective (Cameron and Quinn, 2011) and claim to provide validated tools and instruments for diagnosing organizational culture and competencies using 'competing value framework' (Cameron and Quinn, 2011).

Scenario planning is another school of thought in changing organizational culture and Korte and Chermack (2006) present scenarios as a proactive tool for developing alternative, potential cultures as an initial step in the deployment of changes in organization (Korte and Chermack, 2006). There are a several literatures reviewed here that takes in to account transformational organizational change management. Abudi (2017) takes a pragmatic approach and explores ways in which change implementation could be done by creating an organizational culture that is receptive for continuous improvement and as a result acceptance and driving of change (Abudi, 2017). To achieve this, Abudi (2017) proposes a project management approach to achieve change and reduce the negative perceptions on change within the organization (Abudi, 2017). Beitler (2013) in 'Strategic Organizational Change' provides a holistic method which includes a systematic approach to diagnosing organizational issues and converting them into a step-by-step action items to design and implementation of change (Beitler, 2013). In terms of exploring potential challenges within the transformational journey (Klein and Sorra, 1996) looks at implementation as a process of gaining targeted audience to commit to use of intended solutions and suggest that effectiveness of implementation is a function of the consistency and quality of the targeted audience, the strength of the organization's climate for the implementation of the innovation and the fit of the innovation to the shared value system of the target audience (Klein and Sorra 1996). Bartunek et el (2011) argue that contemporary real-life corporate approaches are far ahead in knowledge compared to the academic knowledge related to planned organizational changes (Bartunek et el 2011) and point out that even if these issues have been given focus by many scholarly authors over the years, the depth and the width of these issues are under-informed in their publications. Apart from these, the most celebrated enterprise change management approaches such as Kotter (1996) and Lewin (1951) worth a mention. Kotter (1996) proposes an 8-step process to manage enterprise change that goes through, creating sense of urgency, building a guiding coalition, form vision, enlist volunteers, enable action, generate short-term wins, sustain acceleration, and institutionalize change. Judging by these dimensions it can be argued that Kotter (1996) covers primarily managing softer aspects of change and these aspects need not happen in a sequence. Singh and Ramdeo (2020) establishes a project management approach that covers a sequence of steps, namely, entering and contracting change, diagnosis, data collection, data analysis, development and implementation, and evaluation and follow-up (Singh and Ramdeo, 2020). For the proposed framework in this paper, a combination of Kotter (1996) and Singh and Ramdeo (2020) is suggested as they both address different, yet important dimensions of enterprise change management.

2.2.3.2. (F2) of figure 1: Literature addressing aspects related to change leadership in driving organizational changes

Out of factors of organizational change efforts and innovation, leadership of the organization at various levels had been a factor that has attracted research attention. Jung et el (2003) examine the style of top leadership within the organization as the most important factor and they show the gap of research targeted on examining the link between this factor and organizational innovation. Eisenbach, et el (1999) draw parallels between the change related scholarly work and leadership literature, specifically the transformational leadership school. They argue that capabilities within the organization as a key determining factor of successful change implementation and transformational leadership as the key driver of these capabilities (Eisenbach, et el 1999). Anderson and Anderson (2010) provides a change process methodology, as well as a roadmap to the leaders engaged in driving transformational change in complex organizational situations.

3. DEVELOPING AN ENTERPRISE LEVEL LEAN TRANSFORMATION FRAMEWORK FOR SERVICES

Towards proposing a transformational framework for a lean enterprise using currently established theories requires establishing connections meaningfully. Transformation implies achieving a new status from the existing, and this implies the need of objective awareness of the starting status, and management of the journey towards achieving a defined future status. Below sections explain, how the theories already explored within the literature review are strung together to create a transformation approach. This also answers the issue highlighted by (Farshid et. el (2006) the need of a framework of application for lean in services from a transformational point of view.

3.1. Creating objective awareness of the starting point and the targeted future status (assessing lean maturity)

In a lean transformation journey the starting point could be the pre-transformational lean maturity level that can be measured using existing lean maturity models (e.g. Nightingale and Mize, 2002, Sánchez and Pérez, 2001, Nesensohn et al, 2014, Donovan, 2015, Ray et al, 2006 and Urban, 2015). Out of these, only Urban (2015), can be directly used in services lean transformation as the rest are intended for different industries. However, Urban (2015) does not comprehensively cover lean principles (Spear and Bowen, 1999, Spear 1999 and Liker, 2004) and does not interpret specifically lean principles service industry language (Liker, 2016). To ensure objectivity of assessing current lean maturity of a service organization, lean principles need to be expanded into representative and observable tools and behavior routines. For this to be achieved, an academic exercise is needed to map a comprehensive list of observable lean service behaviors and generic tools to the lean service principles. To achieve this, lean kata behaviors (Rother, 2010) translated into services and lean service tools (Bicheno, 2008) can be used. However, these tangible and observable behaviors will only provide the measurement dimension of lean maturity and not the maturity level. Different scaling systems are used by the above-mentioned lean maturity models to assess the maturity levels (e.g. 0-5 rating of existence of the lean principle in Urban, 2015 index). Although within the lean sphere, there is no maturity model with each maturity level is defined with observable behaviour and routines, there are other domains such as Capability Maturity Model Integration CMMI – Developed by Carnegie Mellon University (Curtis et el, 1995). CMMI maturity index structure has been accepted widely and used in developing different maturity models for example, Project Management Maturity Model by Office of Government Commerce, UK. In this paper, it is proposed to use an adopted version of CMMI (table 3) to measure the maturity of lean in a service. An objectively developed maturity model can be used throughout the lean transformation journey from pre-transformation phase, achieving a defined target phase, and in the journey of continuous improvement. Maturity model serves the purpose of answering the two critical questions ‘where’ is the organization now and ‘what’ status to achieve as an enterprise.

3.2. Managing the lean transformational journey for services (maturing in lean)

As stated earlier lean transformation demands for a thorough strategic change management effort that covers various systems within the organization, processes, and behaviour routines. To be able to manage this process in a structured manner, it requires approaches that cover, hard project management of change (e.g. change processes of Abudi, 2017, Singh and Ramdeo, 2020), soft change management (e.g. change steps by Kotter, 1996 and Klein and Sorra, 1996), an approach to diagnose current issues deeply including processes, systems and behaviour aspects (Keyte and Locher, 2016, Beitler, 2013, Bell and Orzen, 2010 and Dean, 2013). Unlike in 3.1 above, the paper does not attempt to compare alternative approaches of change management due to the vastness of the field.

However, based on academic credibility and fit for the purpose, change process of Singh and Ramdeo (2020) as the project management change approach and Kotter (1996) as the softer change management approach are proposed. It is the point of view of this paper that there is no gold standard change management approach facilitating enterprise lean transformation. Apart from having a comprehensive change management approach, it is also proposed to ensure awareness and management of potential barriers (Asif et el 2015 and Jadhav et el 2014) and contextual differences (Ruffa, 2008) in deployment of lean in services. Figure 2 consolidates the proposed lean transformation framework. The figure also shows the chosen/proposed theoretical base.

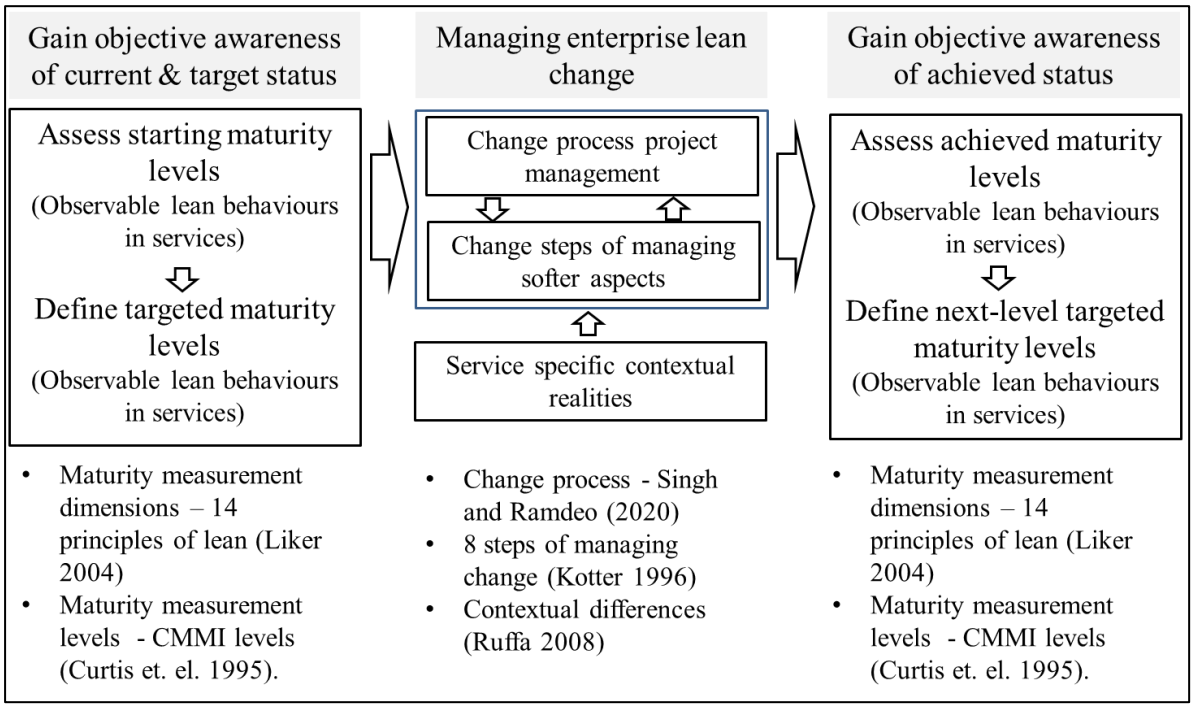

Figure 2: Conceptual framework 'Managing enterprise lean transformation'

Expanded versions of theories proposed to be used within the components of the lean transformation framework in figure 2 are showcased in tables 1, 2, 3, 4 and figure 3.

Table following on the next page

Principle #1 – "Base your management decisions on a long-term philosophy, even at the expense of short-term financial goals."
Principle #2 – "Create a continuous process flow to bring problems to the surface."
Principle #3 – "Use 'pull' systems to avoid overproduction."
Principle #4 – "Level out the workload (work like the tortoise, not the hare)."
Principle #5 – "Build a culture of stopping to fix problems, to get quality right the first time."
Principle #6 – "Standardized tasks and processes are the foundation for continuous improvement and employee empowerment."
Principle #7 – "Use visual controls so no problems are hidden."
Principle #8 – "Use only reliable, thoroughly tested technology that serves your people and process."
Principle #9 – "Grow leaders who thoroughly understand the work, live the philosophy, and teach it to others."
Principle #10 – "Develop exceptional people and teams who follow your company's philosophy."
Principle #11 – "Respect your extended network of partners and suppliers by challenging them and helping them improve."
Principle #12 – "Go and see for yourself to thoroughly understand the situation."
Principle #13 – "Make decisions slowly by consensus, thoroughly considering all options; implement decisions rapidly."
Principle #14 – "Become a learning organization through relentless reflection and continuous improvement."

Table 1: 14 Principles of Lean (Liker 2004 p67)

It could be argued that above principles can be applied across any industry. This is a valid argument and the service sector value of the conceptual model emerges when observable behaviors representing the principles are expanded relevant to service sector and use of service specific contextual knowledge in change management. Below is a demonstration of how expansion of one of the Liker (2004) principles 'principle 4-levelling workload' in 'observable behavior' language at different levels of maturity in a service context. It is not the intention of this paper to expand the conceptual model to such granular level of detail.

Principle	Maturity level 1	Maturity level 2	Maturity level 3	Maturity level 4	Maturity level 5
Level out the workload	Reactive workload allocation only when a team members are overloaded No visibility to regular amounts of workload using data	Reactive workload allocation based on judgment of leader Workload data only visible after the tasks are completed	Workload allocation planned prior to assignments Workload data measured and used for resource allocation	Team trained on multiple tasks and handle different work within the team	Data is fully automated and planned allocation demand is automated Active resources sharing between different teams happens

Table 2: Illustrative example of how a lean principle could be expressed at granular level within a service organization: (Author developed)

Alternatively, a rating system as explained earlier inspired by CMMI (Curtis et el 1995), can be used. Table 3 is a demonstration of developed generic maturity levels developed by the author.

Table following on the next page

Maturity Level 0:	Incomplete - behaviours and use of tools
Maturity Level 1:	Initial - inconstant and adhoc behaviours and use of tools
Maturity Level 2:	Managed - Planned behaviours, performed and measured
Maturity Level 3:	Defined - Behaviour and use of tools are standards of the organization and consistently performed
Maturity Level 4:	Quantitatively Managed - Behaviours and use of tools are data driven, objectives are in place, aligned and predictable
Maturity Level 5:	Optimizing - Behaviours drive continuous improvement, agility and innovation

Table 3: Maturity levels rating reference: Adopted from CMMI (Curtis et el 1995)

Singh and Ramdeo, (2020, change model clearly show how an interventional at organizational level could be broken into phases of change.

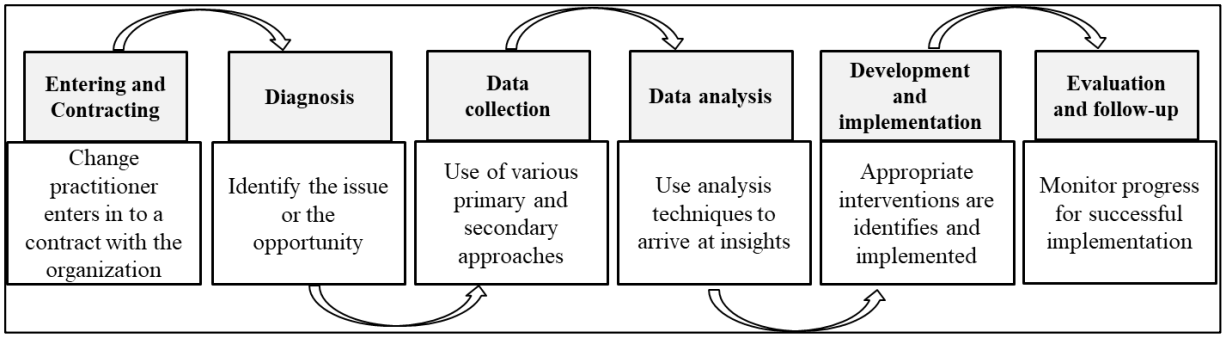

Figure 3: Change process: (Singh and Ramdeo, 2020)

Kotter (1996) change steps are proposed as the approach for the management of soft aspects of change such as stake holder management, management of resistance for change, and management of expectations etc. The framework proses these softer aspects of Kotter (1996) to be embedded within the hard change process of Singh and Ramdeo (2020).

Step One: Create Urgency within the organization
Step Two: Form a Powerful Coalition to drive change
Step Three: Create a compelling vision for Chang
Step Four: Communicate the Vision everyone
Step Five: Remove Obstacles from changing
Step Six: Create Short-Term Wins and celebrate success
Step Seven: Build on the Change using them as success stories
Step Eight: Anchor the Changes in Corporate Culture and embed

Table 4: Change steps (Kotter, 1996)

4. CONCLUSION AND DISCUSSION

The paper covers note-worthy literature in lean, lean services, lean transformation and propose a conceptual model for lean transformation for services. The framework can be a starting point to frame future research of lean transformations in services from inception to achievement of different maturity levels. However, it should be noted that all components within the conceptual model do not have robust service-sector theories behind them, and this makes it obvious the void of literature on lean transformation in services. The framework carries conceptual strength but demands further research on critical areas such as defining lean maturity rating levels for services and defining observable behaviors of lean for a service organization. It is noticeable that large portion of the knowledge within the lean space comes from few popular books instead

of publications within academic journals and most academic researches have relied on these books for initial conceptual frame. This observation calls for stronger need for further academic research specially within the space of lean transformation in services. Planned transformational changes takes few years at minimum to show observable organizational changes from a lean point of view and this could be more apparent within services. However, this should not limit the research appetite and service organizations who have committed for lean journeys deserve in-depth academic attention.

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AGGREGATION METHODS INFLUENCE THE EMPLOYEE PERFORMANCE RANKING LIST

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ABSTRACT

The purpose of this study is to examine the effect of aggregation methods of subjective performance ratings on performance ranking list. Subjective rating is key part of the individual performance evaluation. As the consequence of subjectivity, there are strict raters who generally use lower rates while generous raters give rather higher rates. Raters can influence the final ranking. Therefore, there are methods to reduce subjectivity in ratings. This study contributes to the performance evaluation literature with analyzing 4 aggregation methods and their effect on the ranking list. Data is collected from a medium size IT service firm. t-test is used to compare strict raters with generous raters and poor performers with good performers. Four different aggregation methods are tested, and their ranked lists are compared. This study shows that employees ranked at the bottom because strict raters evaluated them. There are methods to eliminate the subjective differences, however these methods affect the final ranking. The top n or bottom n group of employees are different for the tested methods. Practitioners must be aware of the fact that there are strict and generous raters. Assigning more strict or more generous raters to a ratee may influence the final ranking. Instead of ratings. managers can collect subjective information such as examples and make the final ratings themselves.
This paper sheds a light on the sensitivity of methods attempting to reduce the personal differences in subjective performance evaluation.
Keywords: *Performance evaluation, subjective performance rating, performance ranking, aggregation methods*

1. INTRODUCTION

Performance evaluation of individuals consists of objective criteria that can be measured and subjective criteria that are evaluated using subjective rating scales. Subjective evaluation has two types. It can be numeric or linguistic (Espinilla et al., 2013). Subjective performance evaluation is effective only if the superior makes fair and unbiased decision (Bellavance et al., 2013). Subjective ratings and objective measures are not interchangeable (Bommer et al., 1995) Subjectivity is based on personal feelings, impressions and opinion. It is a judgement, therefore cannot be verified by a third person (Bol, 2008). Three forms of the subjectivity appear in the performance appraisal literature: judgement of performance, flexibility in weighting performance measures and deciding how to use the measures (Gibbs et al, 2004). The ex post flexibility effects the perception of procedural justice. The quality of superior and employee relationship reduces those effects. While, voice opportunity increases the effect (Bellavance et al., 2013). Subjective scales of performance evaluation contain number of items. Examples for end points are: Totally disagree and totally agree, never and extremely often, (e.g. Woods, 2012, Gordon et al. 2018). The raters may interpret differently these items as they are not exactly defined. Objective measurement extended with additional subjective evaluation is superior to the purely objective performance measurement (Kunz, 2015).

Compared to objective measurements, subjective evaluation has several benefits. Objective measures are incomplete, they are noisy, as their outcome may depend on factors that are out of the employee's control. They deficient when they are not congruent with the organization's objectives or when they can be manipulated (Woods, 2012). Employees ignores dimensions of their job that is not measured. Ex post subjective evaluations can consider information that were not known when objective measures are ex ante set (Bol, 2008). Value enhancing job dimensions may be difficult to capture on objective manner. The effect of unforeseen or uncontrollable external factors may be compensated by subjective evaluations (Voußem et al. 2016). Subjectivity can be used to encourage cooperation (Gibbs et al., 2004). Besides advantages, subjective performance evaluation has some drawbacks, too. Cognitive distortion may happen, if the objective measures are known at the time of subjective evaluation. When the objective measures are relatively high, the subjective evaluation will also be higher. In addition, the effect of objective measures depends on how much the individual can control them. Subjective evaluations may adjust the impact of uncontrollable events (Bol & Smith, 2011). Subjective performance evaluation has two main limitation: leniency and centrality bias (Golman & Bhatia, 2012). The first refer to the situation where there are moo many employees in the upper range. Noisy performance signals and asymmetry in manager's preferences are the main reasons why managers overrate employee's performance. The later means too little variation in the ratings. Subjectivity raises behavioral issues such as trust or conflict in perception between manager and subordinate. Subjectivity has positive effect on performance when there is a trust between the subordinate and the manager (Gibbs et al., 2004). Performance appraisal is a relevant process which is used in most of the organizations. Its result may be used in several other processes and decisions such as promotion, compensation (salary or bonus) or trainings and development (Espinilla, 2013). In order to make those decisions, different appraisals may be used. Knowing the raters are biased, some of them rather overrate the employee's performance some others are more certain in the performance or more strict may give lower rates. It is assumed, the rater's behavior affects the final ranking. Those employees' overall ratings are lower who are rated by more certain or strict evaluators. Despite of its drawbacks, subjective performance is an important part of the performance appraisals. For example, there is an inverted U-shaped relationship between subjectivity emphasis and perception of distributive and procedural justice (Voußem et al., 2016). Therefore, it is important to understand how subjective rating may affect the final evaluation. This knowledge may help practitioners to better understand how they influence the final ranking when applying methods to reduce subjectivity in rating. When employees are rated by several other persons, average rate may be calculated for all evaluated persons and ranking list is created. Due to subjective evaluation some of the raters are stricter and use lower rates while others are rather generous and gives higher rates. This assumption leads to the research question as: Are those employees who are located at the end (or beginning) of the ranked list are evaluated by more (or fewer) strict rater? This article uses rating data from an IT services firm to find the answer to the research question using statistical tests. Four different method is analyzed and compare the ranked lists. The next section summarizes the literature on subjective ratings. Followed by the description of the data and research methods as well as results. Finally, a conclusion is drawn with recommendation for practitioners.

2. LITERATURE REVIEW

Performance evaluation literature deals with two cases. One is concerned with the manager's evaluation of her employee's performance (e.g. Golman & Bhatia, 2012). The other, widely used method, is the 360-degree performance evaluation. In this case, several persons are involved to rate one individual: manager, coworkers, collaborators, subordinates, customers and even some cases the employees evaluate themselves (Espinilla et al., 2013).

Involving various groups in the evaluation provides rich information. Evaluations from within the group have high reliability. However, performance evaluation from different groups may reflect the performance from different perspectives and the measures coming from different groups may not easily be compared (Chenhall & Langfield-Smith, 2007). The raters evaluate one individual's performance based on several criteria which provides a heterogenous information. All those evaluations made about an individual's performance need to be aggregated to get the final rating and ranking within the organization. It may be sophisticated process by using different weights assigned to evaluators and criteria (Moon, et al., 2010). 3 step process may be used for aggregation which includes creating collective criteria values, global criteria values and global values (de Andrés et al., 2010, Espinilla et al., 2013, Titkanloo et al., 2018). First, the aggregation is made within each evaluation group, i.e. managers, coworkers, subordinates, etc. Next, result of all groups are aggregated for each criterion. Finally, each evaluated individual is assigned with a single value evaluation by aggregating all criteria. Several methods may be used for making the aggregation. Simple or weighted average, fuzzy operators or mathematical models such as goal programming may be used (Titkanloo et al., 2018). Before making the aggregation, the original evaluations may be transformed. Espinilla et al., (2013) uses a 2-step transformation called unification. First, the numeric, linguistic and interval parameters are transformed into fuzzy sets. Second, they are transformed into linguistic 2-tuples. The aggregation is made in the linguistic domain. Normalization is another way of preprocessing the evaluations before the aggregation. In this process, each evaluator's rates are transferred to a value between 0 and 1, where the lowest rate is transformed to 0 and the highest rate to 1 (de Andrés et al., 2010). When the aggregated ratings for all individuals within the organization are available, they are calibrated. The purpose of this activity is to adjust ratings. It is mainly used to remove leniency bias. The relatively high rates are lowered. On the other hand, the relatively low rates are not increased (Demeré et al., 2019). Some organizations use forced distribution, which means they define the distribution what the final evaluations must follow. Forced distribution positively effect the performance on short term. On longer term, the effect is negative via mediators as motivation, attraction and retention of high performers. Citizenship performance is also negative effected via perception of injustice and dysfunctional. In addition, it generates counterproductive performance (Moon et al., 2016). Selection of the evaluators and the aggregation method influences the final evaluation. In order to reduce the effect of the extreme evaluations, too high or too low evaluations may be excluded from the final evaluation. As it is not known how to remove some of the evaluations, methods are needed that considers all information. (Moon et al., 2010). Not all evaluators are able to evaluate all criteria for all individuals (de Andrés et al., 2010). There are personal differences in the subjective evaluations. Different raters may use different dimensions of performance or define these dimensions differently. When dimension is not defined for each job, but one definition exists for everyone or group of jobs within an organization, the rater defines the dimension and evaluate accordingly. Additionally, scales may be defined in with expressions (e.g. Woods, 2012, Gordon et al. 2018). It also gives the possibility to the raters to interpret according to own judgement. In case of same definition or weighting, rates may have different opportunities to observe the individuals whom they evaluate (Chenhall & Langfield-Smith, 2007). Even working closely to each other, different rater may value other contributions or behaviors of the evaluated person. Evaluators may consider uncontrollable events differently. They may be ignored or compensated. Moreover, not all events may be known to all evaluators. As subjective judgement or weights set by humans are considered in an algorithmic procedure, different final ranking of the employees may happen when any of those parameters are altered. This means different final ranking of the employees are created. Authors made effort to eliminate the subjectivity by norming (de Andrés et. al., 2010) or unifying (Espinilla et al., 2013) the judgement of raters.

Apart from the subjectivity, there may be several reasons why raters give lower some other gives higher rates. One reason may be a rater who gives lower rates asked to evaluate employees with lower performance. According to the prior literature and the assumptions the following hypotheses are made that help answering the research question and will serve the basis of the analysis.

- Hypothesis 1: Employees are ranked higher because they are evaluated by more generous evaluators.
- Hypothesis 2: Employees are ranked lower because they are evaluated by more strict evaluators.
- Hypothesis 3: Generous raters gives higher rates because they evaluate more good performers
- Hypothesis 4: Strict raters gives lower rates because they evaluate more poor performers

In order to test the hypotheses, rating data is collected from an IT firm and statistically tested. Poor performer ratees are those employees who are in the bottom third of the ranked list of employees. The top third employees of the ranked list are the good performers. An ordered list of raters is created based on their average rate. The top third of the raters called generous raters. The bottom third are the strict raters. The following section describes in details the data and the method. Statistical method compares the top and bottom third of both raters and ratees.

3. RESEARCH METHOD

3.1. Data

Subjective performance data is collected from a middle size IT service company Central Europe. The evaluation criteria consist of 5 behavior elements derived from the firm's values and additional 3 items for managers. The scale is from 1 to 6, where 4 is the expected behavior. There are 2 items above and 3 below the expectations. There are 54 employees who were rated by 50 colleagues. The raters got information as the explanation of the categories and the definition of rates. The same method has been used for 6 years. Therefore, it is well known for most of the raters. HR manager prepared and distributed the spreadsheets to all raters. One spreadsheet contained all names (rows). The columns contained all 5 items with the definitions. Raters could give a rate between 1 and 6 as well as a textual evaluation for each category separately and an overall evaluation text. In case of managers, an additional spreadsheet was used. It contained columns for all three managerial skills. Both, a rate between 1 and 6 as well as a comment could be given for each. In additional an overall evaluation could be given. After explaining the process, HR manager distributed the Excel sheets to all raters via email. The raters sent back the Excel sheets in email after they made the evaluations. HR manager collected all Excel sheets and made summary for all ratees. Average rate is calculated for each rater. Bases on the ratio of each rater's average and all raters' average, the all rates of each rater are recalculated in order to eliminate the differences between the averages. The final ranking list of employees is calculated from the recalculated rates. After processing all evaluations, HR manager presented the top 4 employees, without the exact rank, to the whole company. The bottom 10% (5 employees) had a "how to continue" discussion with their managers. In order to process the data, the original data in Excel sheets is transformed to rater-ratee-rate-category data sets for the analysis. Other variables as groups of rate and rater (figure 1) were added. This format was used as the input to the JMP pro 13.1.0 statistical software.

3.2. Descriptive statistics

One rater gave minimum 5, maximum 128, average 40.8 rates with standard deviation of 24.1. Altogether 2040 rates are given. The average of all raters' average is 4.77, standard deviation is 0.31. The rates are rather above expectations even the items of the scale are clearly defined.

The average of all raters' standard deviation is 0.55, standard deviation is 0.22. There raters did not use the whole scale. One rater used only one value from the scale. 18 raters used 2 consecutive values. 19 raters had 2 as the difference between the highest and lowest rates they gave. 10 raters had 3 and 2 raters had 4 as the difference between the highest and the lowest rates. Ratees got minimum 3, maximum 94, average 37.8 rates, standard deviation is 20,0. The average of ratee's is 4.77, standard deviation is 0.40. Not everyone was rated by his or her immediate manager.

3.3. Method

Four different aggregation methods are evaluated. First, the rates are averaged for each ratee. The original rates are used without any transformation. Second, the 2 extreme low and 3 extreme high raters are excluded, and their rates are not considered (Moon et al., 2010). It is assumed that majority of the raters are not too strict or too generous. Third, all rates are weighted according to the given rater's average rate. Weight applied is equal to average of "*raters' average rate*"/"*rater's average rate*". This method is used at the firm which provided the data. The method intended to remove the strictness and generousness from the rates. Four, all rates are normalized between 0 and 1 for each rater, (de Andrés et al., 2010). With normalizing the rates, the effect of both leniency and centrality bias may be reduced. The transformation is made for all rates of each rater. The rater's lowest rate is transformed to 0 and the highest rate to 1. One rater used only one value. Those rates are transferred to 0.5. Both, the raters and the ratees are divided into 3 groups based on the average of the rates the gave and got. Table 1 and 2 shows the main parameters of these groups. For each rater, each rate is marked as it is given to good, mid or poor performer ratee (figure 1). After all rates of a given rater is marked, a percentage of poor performer and a percentage of good performer ratees are available for that rater. Similar percentages are calculated for ratees also based on the rater groups. Averages and standard deviation are available for each group in table 1 and 2.

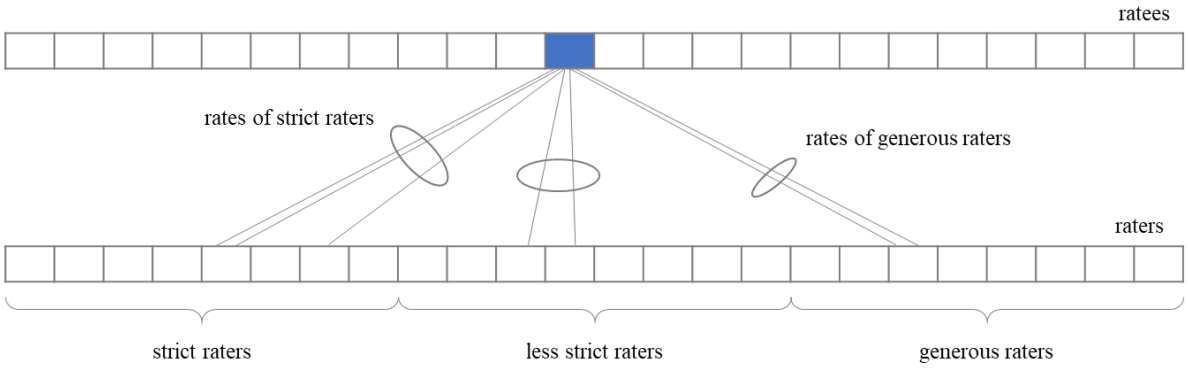

Figure 1: Marking rates of a ratee based on the raters' group

Table following on the next page

	strict raters	less strict raters	generous raters	Total
N (raters)	17	16	17	50
Average of raters' average	4.45	4.79	5.07	4.77
Standard deviation of raters' average	0.21	0.08	0.19	0.31
Average of poor performer ratees ratio	48%	29%	18%	32%
Standard deviation of poor performer ratees ratio	33%	15%	11%	25%
Average of good performer ratees ratio	25%	30%	41%	32%
Standard deviation of good performer ratees ratio	23%	21%	26%	24%

Table 1: main parameters of rater groups

	poor performer ratees	average performer ratees	good performer ratees	Total
N (ratees)	18	18	18	54
Average of ratees' average	4.34	4.86	5.10	4.77
Standard deviation of ratees' average	0.39	0.05	0.13	0.40
Average of strict raters' ratio	48%	26%	26%	33%
Standard deviation of strict raters' ratio	28%	11%	15%	22%
Average of generous raters' ratio	25%	42%	43%	36%
Standard deviation of high (ő) raters ratio	21%	18%	18%	21%

Table 2: main parameters of ratee groups

Strict and generous rater groups are compared in terms of how much percentage of poor performer and good performer ratees they evaluated. Similarly, poor performer and good performer ratee groups are compared in terms of how much percentage of strict and generous raters evaluated them. T-test was used (Freedman et. al, 2007) to compare strict raters with generous raters and poor performers with good performers. Each rater is assigned with the percentage of poor performer and percentage of good performers. Percentage of poor performers and percentage of good performers are compared between rater groups. Each ratee is assigned with a percentage of strict raters and percentage of generous raters. Ratee groups are compared considering percentage of good performers and percentage of good performers. When calculating the p-value, student curve is used instead of normal curve (Freedman et. al, 2007) which is less piled in the middle and more spread out. JMP Pro 13.1.0 software were used to calculate the parameters of the test.

4. RESULTS

Table 3 to 6 shows the parameters and results of the t-test for hypothesis 1 to 4, respectively. The same tests have been performed for all four methods. In case of the method which excluded the extreme low and extreme high raters, new groups for raters have been formed for the remaining raters. In case of the weighted raters method, the original rater groups were used. Because of the method, after the weighting applied, the average rates of raters become the same (small differences remained due the rounding to two digits). Due to the new rates, the ratee groups have also been recalculated. For the normalized method, both the rater and ratee groups have been recalculated as new rates were used for calculating the average rates.

	Average	Without extremes	Weighted	Normalized
Alpha	0.05	0.05	0.05	0.05
Degree of freedom	34	34	34	34
Difference of means	0.184	0.148	0.039	0.150
Standard Error of difference	0.066	0.074	0.079	0.069
$t_{critical}$	2.032	2.032	2.032	2.032
$t_{calculated}$	2.803	1.986	0.498	2.171
p-value	0.008*	0.055	0.622	0.037*
Hypothesis 1	supported	rejected	rejected	supported

Table 3: Test of difference of means: poor and good performer ratee groups, percentage of generous raters

The difference of means refers to the means of percentage of generous raters. The test proves there is a significant difference in terms of ratio of generous raters between poor and good performer ratee groups in case two method. Therefore, hypothesis 1 is supported in these cases.

	Average	Without extremes	Weighted	Normalized
Alpha	0.05	0.05	0.05	0.05
Degree of freedom	34	34	34	34
Difference of means	0.216	0.138	0.091	0.118
Standard Error of difference	0.076	0.094	0.081	0.071
$t_{critical}$	2.032	2.032	2.032	2.032
$t_{calculated}$	2.832	1.471	1.119	1.669
p-value	0.008*	0.151	0.271	0.104
Hypothesis 2	supported	rejected	rejected	rejected

Table 4: Test of difference of means: poor and good performer ratee groups, percentage of strict raters

Table following on the next page

	Average	Without extremes	Weighted	Normalized
Alpha	0.05	0.05	0.05	0.05
Degree of freedom	32	28	32	32
Difference of means	0.151	0.166	0.116	0.137
Standard Error of difference	0.085	0.066	0.078	0.076
$t_{critical}$	2.037	2.048	2.037	2.037
$t_{calculated}$	1.769	2.533	1.500	1.799
p-value	0.086	0.017*	0.144	0.081
Hypothesis 3	rejected	supported	rejected	rejected

Table 5: Test of difference of means: strict and generous rater groups, percentage of good performer ratees

	Average	Without extremes	Weighted	Normalized
Alpha	0.05	0.05	0.05	0.05
Degree of freedom	32	28	32	32
Difference of means	0.302	0.195	0.083	0.078
Standard Error of difference	0.085	0.067	0.066	0.054
$t_{critical}$	2.037	2.048	2.037	2.037
$t_{calculated}$	3.567	2.929	1.249	1.429
p-value	0.001*	0.007*	0.221	0.162
Hypothesis 4	supported	supported	rejected	rejected

Table 6: Test of difference of means: strict and generous rater groups, percentage of poor performer ratees

Table 7 summarize the results of tests for all hypotheses.

	Average	Without extremes	Weighted	Normalized
Hypothesis 1	Supported	Rejected	Rejected	Supported
Hypothesis 2	Supported	Rejected	Rejected	Rejected
Hypothesis 3	Rejected	Supported	Rejected	Rejected
Hypothesis 4	Supported	Supported	Rejected	Rejected

Table 7: hypothesis summary

The four methods show different patterns of supporting the hypotheses. When the rating data is not manipulated, the hypotheses are supported the strict raters are strict because they evaluate more poor performers and generous raters are generous because they evaluate more good performers. Rating data is available for 5 evaluation periods which gives opportunity to compare the rates of raters over time. 36 raters evaluated their colleagues in other periods as well. 17 raters have data in all 5 periods. 6, 6 and 7 raters evaluated their colleagues in 4, 3 and 2 periods, respectively. The range of average rates are calculated for all raters. The minimum is 0.02, maximum is 1.09, average is 0.36 and the SD is 0.25.

5. DISCUSSION

The subjective evaluation data shows both leniency and centrality bias. Only two raters out of 50 gave average rates bellow 4 where 4 means the ratee behaved as expected. All other raters, 96% of raters, gave average rates above the expected. 38% of the raters used maximum two

adjacent values on the 6-point scale. Only 22% used at least 4 values. Creating a ranked list of employees is one of the usage of the subjective evaluation. Not the exact values, e.g. average score counts but the raking of the evaluated employees. In most of cases the top few employees are positively treated while the few lowest ranked employees are subject to discussion for improving performance at workplace. Majority of the ratees are working in the headquarters and each of them has a dedicated line manager. Some other colleagues are working at customers premises without a manager assigned. These people, who are without a manager, are located at the bottom of the ranked performance list. The reasons are similar to the challenges of virtual teams (Zuofa & Ochieng, 2017). Without face to face contact, there is no opportunity for socializing and gain deep knowledge of others' activity. There are raters who are stricter than others. Those ratees that are ranked at the bottom third of the list have significantly higher percentage of strict raters than those ratees who are at the top third of the ranked list. Similar way, those ratees who are at the top of the list have significantly higher percentage of generous raters than those who are at the bottom of the list. This observation suggests that the ranked list depends on who are assigned to strict and who are assigned to the generous raters. However, there are two other observation that contradict to this statement. First, similar test was performed for the raters, too. It showed that the strict raters evaluated significantly higher percentage of ratees who belong to the bottom third of the ranked list. The generous raters evaluated significantly higher percentage of ratees who are on the top third of the ranked list. Second, multi period data show that a rater may be strict in one period and may be in less or the generous rater group in other periods. 17 raters evaluated their colleagues in all 5 periods. Only 5 of them belonged to the same rater group in all periods. 7 were part of the strict and the generous rater groups, as well. Only 2 out of 6 raters who evaluated in 4 periods were belong to the same rater group in all periods. 3 out of 6 raters who evaluated in 3 periods and 3 out of 7 raters who evaluated in 2 periods belong to the same rater group. 36% of raters who evaluated in at least 2 periods belong to the same group in all evaluation. This suggest that raters use the scale and may be strict and less strict or generous raters depending if they evaluate poor performers or good performers. Even though, some raters are strict others are generous, all can create their own ranking lists. Aggregating ranking may be another way of eliminating subjective differences. It would put more responsibility and workload on managers to make the aggregation of information instead of mathematical calculation. In some cases, a final ranked list of employees is created based on their performance (Dessler, 2013). When using the data, either top n or bottom n employees are considered for praise, promotion or performance improvement plan. When selecting the group of employees either from the top or bottom of the list, the actual ranking within the group may be irrelevant. Only the selection counts. The four methods discussed above resulted in different group of employees. Figure 2 shows the overlap between the methods considering the top n employees. In case of top 5 group (10% of evaluated employees) the original average method and the method without extreme raters resulted in the same group of employees. The top 5 group of weighed and normalized method contained only 3 employees from the original top 5 group. In case of top 11 (20% of evaluated employees) the overlap is 10, 9 and 8 with the without extremes, weighted and normalized method.

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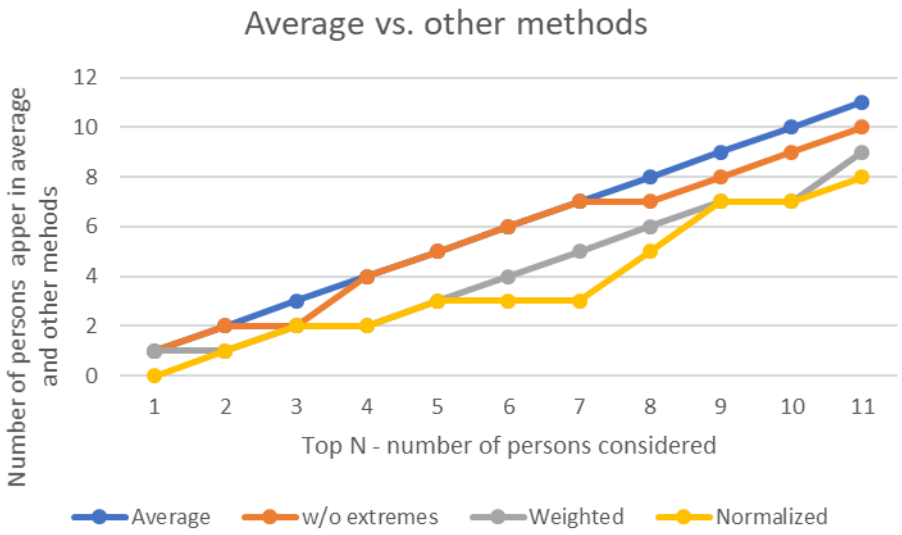

Figure 2: Comparing the top n group of original average method with the groups of other methods

The difference between the groups is larger in case of bottom n lists (figure 3). Bottom 5

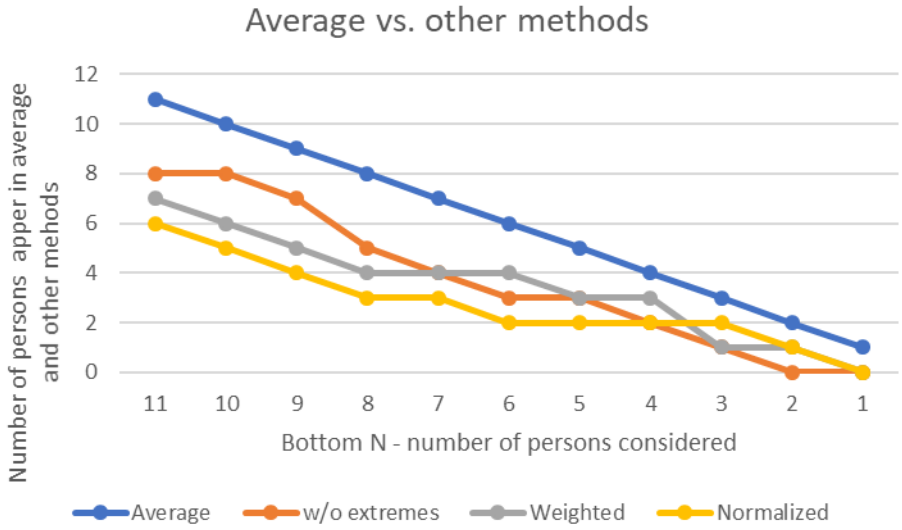

Figure 3: Comparing the bottom n group of original average method with the groups of other methods

(10% of evaluated employees) for without extremes, weighted and normalized methods contains 3, 3, and 2 employees from the original bottom 5 group. For bottom 11 (20% of ranked employees) the overlap between the group of the original average method and without extremes, weighted as well as normalized method is 8, 7 and 6. These data suggest that the top n or bottom n groups and the ranked list is sensitive for the method that is applied to remove the subjective differences from the ratings. There are more items on the scale below the expectation than above the expectation. This suggest that the evaluation is planned to be used for learning and development purposes. In fact, the firm uses it for both praising and development. The bottom part of the ranked list is more sensitive to the aggregation method. It must be carefully decided which aggregation would be used as it affect the final ranking.

Even the group of bottom n employees without exact ranking differs if another ranking method is chosen. Therefore, different group of employees are subject to treatment, e.g. performance improvement plan.

6. CONCLUSION

Performance evaluation contains objective and subjective elements. Subjectivity may be included as the scale may not be fully defined, the raters interpret the scale differently or they may be biased. Despite of the subjectivity, ratings are widely used for employee performance evaluation. This paper contributes to the literature by comparing four methods used for reducing subjective differences in ratings. Rating data is collected from an IT service company operates in Central Europe. 54 employees are evaluated by 50 colleagues at the beginning of 2019. Data show that those employees who are located at the bottom of the list (poor performers) are evaluated by more strict raters that those colleagues who are at the top third of the ranking list (good performers). On the other hand, those employees who are at the top third of the list are evaluated by more generous raters. However, the strict raters are strict because they evaluated more poor performance ratees. 36 raters rated in other periods, out of which 12 raters belong to the same rater group. Namely, a strict rater may belong to less strict or generous rater groups in other evaluation periods. Besides simple average method, three other methods are used to calculate the overall ratings. One method excluded the extreme low and extreme high raters. Another method uses weights to eliminate the difference between the averages of raters. Finally, a normalized method is used to transform all rates of each rater to a number between 0 and 1. The weighted and normalized method do not show the same behavior as the original method. The employees are the bottom third do not have more strict raters than the employees at the top third of the ranked list. The different methods result different group of top n and bottom n employees. The top or the bottom part of the ranking lists are sensitive to the method applied to reduce the subjective differences. Practitioners and managers must be aware of the effect of methods they may use to reduce subjectivity. Different groups of employees may be the subject of treatment, either positive or negative. Subjective rating may be used without any transformation. The effect of subjectivity shall be reduced by better defined scales or trainings rather than transforming the rates. Alternatively, ratings may be avoided, and the evaluators provides textual description of the given behavior. The manager of the evaluated employee can make the final evaluation based on the descriptions. Trainings need to be improved in order to ensure the consistency in ratings. Despite of the fact of conducting training on the categories and the rates, only 3 ratees got average rate below 4 which represents the expected behavior. This result is achieved on a 6 items scale, where there are more items for performance below expectation. It could also be a cultural effect that most of the rates are above expectation. However, if it is real performance where most of the employees perform above expectation, the company may consider employing less senior staff. Doing so, cheaper operation could make the required quality work. As for the first limitation, the data is collected at one medium size company. 50 raters' evaluations are used. Second, only the rates are available, no supplementary data such as ratees' satisfaction with their average or rank. The managers did not tell the employees those pieces of information, therefore they are not available.

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ICE-HOCKEY AS A POTENTIAL IMPROVEMENT OF EMOTIONAL INTELLIGENCE AND RESILIENCE: INCREASING PSYCHOLOGICAL CAPITAL

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ABSTRACT

Playing ice-hockey is a fun activity that may bring joy to the life of the players. In this research, the author seeks the answer whether playing ice-hockey has a contributing effect to the emotional intelligence and resilience levels of people. The authors processed the most recent scientific literature in the field and concluded that it is possible that playing this sport has such a causal relationship with the two psychological factors. The research uses quantitative data, collected from 104 participants. To measure emotional intelligence and resilience, validated scales were used. Cronbach's alpha values showed that both scales were reliable measurers of the ability levels. Results suggested that playing ice-hockey only partially contribute to the two measured abilities of people directly, as the improvement in these abilities are stronger connected to the age of the participants than their years of playing ice-hockey. This means if a company wants to increase its psychological capital and gain a competitive edge, it is suggested that they look for other training methods, and employ older employees, as they are likely to possess a stronger psychological power. The research must be continued to identify whether playing other sports may have stronger contributing effect to the psychological capital of companies.

Keywords: *Emotional intelligence, Resilience, Ice-hockey, Skills improvement, Psychological capital*

1. INTRODUCTION

Playing ice-hockey is a fun activity that brings joy to the life of the players, as it offers complex mental and physical challenges to tackle within different in-game and social situations. As one of the authors is a passionate lover of the sport, the authors of this paper became curious if playing ice-hockey can contribute to the psychological abilities of the persons involved. According to Montgomery (1988) and Vescovi et al. (2006), ice-hockey is one of the fastest team sports in the world, physical force, speed, complicated technical elements, cunning tactics and the fight body against body describes it. The speed, the number of stimuli may create situations that require strong psychological power. In the work of Bhullar (2020), emotional intelligence is defined as the competencies related to understanding, managing and utilizing the emotions of self and other people. In a competitive environment in which many of the existing companies operate, emotionally intelligent employees can contribute much to the overall performance of their companies, mainly by utilizing emotions. In the article of Southwick et al. (2014), different definitions of resilience were identified, but they share some fundamentals: successfully bounce back to harmonic state after an event pushes us out from it. They also claim that it is possible to become even more harmonious after such an event. Resilience is also part of the psychological capital definition of Luthans et al. (2007). When working in an environment that often requires us to mobilize much energy that we use to maintain our mental well-being, resilience becomes a must-have ability.

Therefore, if playing ice-hockey is proven to be an efficient contributor for emotional intelligence and resilience, companies can use it as a method to contribute to their employees' ability, and increase its psychological capital. If playing ice-hockey can contribute to the examined two abilities, companies may use it as a method to gain competitive edge over the competitors. On the society level, such a knowledge is absolutely must-have, as in the 21st century, the importance of having strong psychological power is increasing, especially on the labor market. Luthans et al. (2007) claims that the competitive edge of any company in the 21st century can be earned by people in the company having psychological toughness. The scientific literature uses the term psychological capital when dealing with the psychological toughness of employees of given companies. Building psychological capital is done in two ways: hiring new employees that have such a psychological toughness and keeping them, and encouraging the existing employees to do activities that are proven to contribute to their psychological power.

2. LITERATURE REVIEW

In their meta-analysis, Mattingly and Kraiger (2019) investigated whether emotional intelligence can be trained. They identified 58 published and unpublished longitudinal studies, and calculated Cohen's d to calculate effect size, in order to estimate the effect of the trainings. They found a moderate positive effect, concluding emotional intelligence can be trained and improved. Jonker (2009) examined the effect of an aimed emotional intelligence development program in a longitudinal study with accountant participants. In this research, the Bar-On EQ-i scale was used, in a control group design. The results showed that the group participating in the development program achieved higher scores than the control group, meaning it is possible to improve emotional intelligence with aimed development programs. Foster et al. (2017) claims that emotional intelligence scores of nurses improve over time when applying to a nursing education program. In their longitudinal study, they proved that a significant increasement was measurable in the utilizing emotions part of the scale they used. McEnrue et al. (2009) examined 135 business students in a control-group designed way, in a leadership development program. The participants showed an improvement in trait emotional intelligence, suggesting that well-performed leadership program may have a developing effect on emotional intelligence. Eika et al. (2019) examined the resilience development of nursing students in a longitudinal study. They suggest that resilience may be highly improved when a trustworthy learning culture is built. Taylor (2019) focused on Resilience trainings to decide whether resilience training is a usable intervention method against burnout. She concluded that without dealing with the environmental factors contributing to burnout, resilience training is an incomplete solution. This means a resilience training, along with focusing with the environmental factors are capable of developing the resilience of people, and protect them against burnout. Denkova et al. (2020) examined whether giving short-form mindfulness training to firefighters can contribute to these people's resilience. After receiving the training, the participants showed a significantly higher resilience level than the control group. According to Azavedo and Shane (2019), the MBA students of a Californian university reached higher levels of resilience when tested after finishing the problem, than on the test before. This suggests the examined MBA program was capable of improving the resilience of the participating students. Trottier et al. (2017) claims that when playing sports, coaches may have a positive, developing effect on the life-skills of the players. The coach plays an important role in this development. Friesen (2013) made an analysis on how 16 ice-hockey players from the English professional league regulated the emotions of their teammates when in tough situations which is part of emotional intelligence. As different strategies were identified, the teammates of these examined players could see and learn different strategies to regulate other's emotions. This suggests that playing ice-hockey offers a chance to improve the ability to successfully regulate others emotions, which may become an important ability when working together with

colleagues in their companies. Battochio and Stambulova (2019) revealed the coping strategies of 23 Canadian National Hockey League players. As their different carrier situations required different coping strategies, the players learned different strategies when pursuing their carrier goals. Based on this finding, playing ice-hockey may create situations that requires the person to make use of his/her emotions the best to reach the wanted solution to the situation and be resilient. Côté et al. (2014) claims that personal development through sport is possible - they used the Personal Assets Framework to identify the factors determining personal development. The first factor is personal engagement in activities, the second is quality relationships, and the third is appropriate settings. If a player of ice-hockey gives the chance to this sport to contribute to his/her personal development and these three factors are focused on, playing ice-hockey may have a developing effect on the personality of the player. This paper also suggests that playing ice-hockey does have a developing effect on the person, however, the paper does not mention psychological power as subject of development. Géczi et al. (2009) used CSAI-2, ACSI-28 and STPI-Y self-evaluation questionnaires on the U16, U18 and U20 national ice-hockey team of Hungary. They found significant difference between the age groups in terms of psychological power, meaning psychological power may change when becoming older. Kaplánová (2019) used self-report scales to measure the self-esteem, anxiety and coping strategies to handle stress on 40 male ice-hockey players. They found that coping strategies against stress varies according to the level of self-esteem and anxiety. Reduced anxiety level and increased self-esteem may increase the success in coping with stress. This paper suggests that ice-hockey players face stressful situations, in which coping strategies can be learnt. When in stressful situations, being resilient is an important ability as it may contribute to the efficient management of stress, according to Lester et al. (2020). In addition, Malinauskas et al. (2019) studied the relationship between emotional intelligence and stress coping strategies. They used the Schutte Self-Assessment Questionnaire to measure emotional intelligence, and the questionnaire by Grakauskas and Valickas (2006) questionnaire to identify stress coping strategies. On a sample of 123 participants, they found a significant relationship between the stress coping strategy and the ability to evaluate and express own emotions, which is part of emotional intelligence. This means, when ice-hockey players face stressful situations and learn the possible coping strategy against it, their emotional intelligence may improve as well. Géczi et al. (2008) explored the differences between U18 and adult ice-hockey players with the use of CSAI-2, ACSI-28 and STPI-Y psychometric measures. They found that adult players can handle stressful situations easier than U18 players, which may be caused by having more experience. Kurudirek et al. (2016) found that teaching ice-hockey through educational games has a positive impact on the cognitive development of children aged 8-12. According to McBride (2010), cognitive development is positively correlated with the development of emotional intelligence. Therefore, this paper suggests playing ice-hockey might have a developing effect on the emotional intelligence of the players through their cognitive development. Based on the processed literature, emotional intelligence and resilience abilities of people can be improved through different activities. Older and more experienced ice-hockey players are having stronger coping ability and psychologically measurable differences compared to young ice-hockey players, suggesting that playing ice-hockey may be an activity that improves these abilities.

3. METHOD

Firstly, the author had two research questions, and a targeted literature review was done to identify whether this field is covered by scientific knowledge, and whether the research questions need modification. Though the literature review revealed that there is knowledge connectible with the research questions, the coverage was not satisfactory.

A knowledge gap was found here. The research questions and hypotheses are the following:

- Research question one: Can playing ice-hockey contribute to the emotional intelligence level of the players?
  - Hypothesis one: I assume that playing ice-hockey does contribute to the emotional intelligence level of the players.
- Research question two: Can playing ice-hockey contribute to the resilience level of the players?
  - Hypothesis two: I assume that playing ice-hockey does contribute to the resilience level of the players.

The cross-section study uses two selected psychological abilities - emotional intelligence and resilience to identify whether playing ice-hockey can contribute to the player's psychological power. An anonymous online questionnaire was sent out to all the adult Hungarian ice-hockey players (population size = 1673). The questionnaire contains four parts: 1. basic data of the participant, 2. Schutte et al. (1998)'s Emotional Intelligence Scale, validly translated into Hungarian, 3. Wagnild and Young (1990)'s Resilience Scale, validly translated into Hungarian. According to the literature and hypotheses, the longer the player plays ice-hockey, the higher value he/she must reach on the emotional intelligence and resilience scales. To meet scientific standards, Cronbach's alpha will be calculated for each scale, to identify whether the scale is a reliable measurer of these abilities. In order to accurately identify the contribution of playing ice-hockey to the two examined abilities, the sub-scales of the scales must be included in the research, in both cases. Based on the work of Lane et al. (2009), the Emotional Intelligence Scale has six subscales, with separate items loading them:

1) Appraisal of others emotions subscale, items: EI18, EI26, EI29, EI33, EI32, EI5, EI25
2) Appraisal of own emotions subscale, items: EI9, EI19, EI22, EI15, EI2
3) Regulation subscale, items: EI21, EI14, EI6, EI23, EI1
4) Social skills subscale, items: EI11, EI13, EI30, EI4, EI24
5) Utilization of emotions subscale, items: EI7, EI12, EI17, EI20, EI27, EI31, EI16
6) Optimism subscale, items: EI8, EI28, EI3, EI10

Based on the work of Fernandes et al. (2018), the Resilience Scale's subscales are the following, with the following items:

1) Meaningfulness subscale, items: RES4, RES11, RES13, RES14, RES15
2) Perseverance subscale, items: RES1, RES2, RES6, RES10, RES17, RES18, RES21, RES24
3) Self-reliance subscale, items: RES8, RES9, RES16, RES19, RES20
4) Existential aloneness subscale, items: RES3, RES5, RES22, RES23
5) Equanimity subscale, items: RES7, RES12, RES15

The research uses regression analysis, as it can reveal the causal relationship between parts of basic data and values measured by the scales used. Foster et al. (2017) claims that emotional intelligence improves when becoming older. Gooding et al. (2011) proved that older adults show higher resilience levels than the younger. In order to catch whether ice-hockey has a contribution to the abilities, a separation between the effects of playing ice-hockey and the effects of becoming older must be done. In the basic data section of the online questionnaire, the filler has to mark his/her age, and for how long has he/she been playing hockey for. Comparing the linear regression values of these two effects with the subscales of the two scales will make clear whether playing ice-hockey contributes to these abilities, or is it becoming older which makes the players improve in these abilities.

4. RESULTS

A total amount of 104 adult ice-hockey players participated in the research, the answer rate is equal to 6.216%. Cronbach's alpha value for the emotional intelligence scale showed a strong, .810 value, the Resilience scale showed .842 meaning both scales are reliable and usable for our research.

Emotional Intelligence Scale subscales	Years spent playing ice-hockey	Age
1. Appraisal of others emotions subscale	No linear regression model could be built.	No linear regression model could be built.
2. Appraisal of own emotions subscale	No linear regression model could be built.	No linear regression model could be built.
3. Regulation subscale	No linear regression model could be built.	Adjusted R square = 0.129 F value = 16.227 Significance = 0.000
4. Social Skills subscale	No linear regression model could be built.	No linear regression model could be built.
5. Utilization of emotions subscale	No linear regression model could be built.	No linear regression model could be built.
6. Optimism subscale	No linear regression model could be built.	Adjusted R square = .100 F value = 12.505 Significance = 0.001

Table 1: Emotional intelligence Scale subscales linear regression models with the players' years spent playing, and age
(Source: Own creation)

As seen from Table 1., between the years spent in ice-hockey of players and neither of the emotional intelligence subscales could a linear regression model be built, meaning no causal relationship exists in the data between them. This means, playing ice-hockey cannot contribute to the emotional intelligence of the players. A linear regression model could be built between the age of the players, the regulation of emotions and optimism. In every other case, no regression model could be built between the values. This means the regulation of emotions of the players and the optimism are improving over time, but show no relationship with playing ice-hockey. Therefore, I reject my first hypothesis.

Table following on the next page

Resilience Scale subscales	Years spent playing ice-hockey	Age
1. Meaningfulness subscale	No linear regression model could be built.	Adjusted R square = 0.032 F value = 4.449 Significance = 0.037
2. Perseverance subscale	No linear regression model could be built.	No linear regression model could be built.
3. Self-reliance subscale	No linear regression model could be built.	No linear regression model could be built.
4. Existential aloneness subscale	Adjusted R square = 0.031 F value = 4.319 Significance = 0.040	Adjusted R square = 0.073 F value = 9.079 Significance = 0.003
5. Equanimity subscale	No linear regression model could be built.	No linear regression model could be built.

Table 2: Resilience Scale subscales linear regression models with the players' years spent playing, and age
(Source: Own creation)

As seen from Table 2., in the case of Meaningfulness subscale, only with of the age of player could a model be built. A linear regression model could be built between years spent playing ice-hockey, and Existential aloneness subscale value. However, a stronger causal relationship was found between the age of the player and the subscale. This means resilience abilities improve when becoming older, and as the model was weaker in the case of years spent playing ice-hockey, this result suggests that this improvement is more likely to be caused by ageing, and only partially by playing ice-hockey. In every other case, no regression model could be built. Therefore, playing ice-hockey may contribute to the resilience ability of the players, as the improvement is more likely to be caused by becoming older. Experts of sport psychology suggested however the linear regression model could be built between time spent playing ice-hockey and existential aloneness values, their experience suggest that the improvement effect is more likely to be caused by becoming older, and an interdependence is present between age and time spent playing ice-hockey. Therefore, reject my second hypothesis.

5. DISCUSSION, LIMITATIONS AND FUTURE OF RESEARCH

In this research, the author seeks for the answer of the question whether playing ice-hockey can contribute to the emotional intelligence and resilience abilities of people, so whether managers in companies can use playing ice-hockey as a training method to contribute to the two mentioned abilities of the employees, and increase the psychological capital of their companies. The results revealed that playing ice-hockey cannot contribute to emotional intelligence and resilience abilities of the players, as the improvement is stronger connected to the age of the players, than their time spent playing ice-hockey. This means companies now must find another method to use instead of sending their employees to play ice-hockey, and hire older employees if they want to increase the psychological capital of their companies, and gain competitive edge over their competitors (Luthans et al. (2007)). It is also important to mention that encouraging employees to play ice-hockey may support the employee's healthy work-life balance, and based on the literature, does help the employees to successfully learn coping strategies against stress and anxiety (Kaplánová (2019), Grakauskas and Valickas (2006), Battochio and Stambulova (2019)). The limit of the research is mostly it's cross-sectional design, the low rate of answers, and the fact that it is very hard to separate the effect of playing ice-hockey and becoming older in the two measured abilities, as the older the player is, the more time he/she could spend playing this sport.

This interdependence limits the research. Further, longitudinal research with higher representativity is required to measure if such an increasing effect exists in playing different sports. Still, the research focused on the psychological capital increasement option, so whether it is a good decision for companies to hire ice-hockey players, or purposely send them to play this sport. Though the results showed that this increasement is more likely to be caused by becoming older, the literature suggests that playing ice-hockey does contribute a lot to its players life, maybe even in emotional intelligence, and resilience.

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APPENDIX

1. Schutte et al. (1998) - Emotional intelligence Scale, validly translated into Hungarian (5-item Likert scale):
EI1: I know when to speak about my personal problems to others
EI2: When I am faced with obstacles, I remember times I faced similar obstacles and overcame them
EI3: I expect that I will do well on most things I try
EI4: Other people find it easy to confide in me
EI5: I find it hard to understand the non-verbal messages of other people*
EI6: Some of the major events of my life have led me to re-evaluate what is important and not important
EI7: When my mood changes, I see new possibilities
EI8: Emotions are one of the things that make my life worth living
EI9: I am aware of my emotions as I experience them
EI10: I expect good things to happen
EI11: I like to share my emotions with others
EI12: When I experience a positive emotion, I know how to make it last
EI13: I arrange events others enjoy
EI14: I seek out activities that make me happy
EI15: I am aware of the non-verbal messages I send to others
EI16: I present myself in a way that makes a good impression on others
EI17: When I am in a positive mood, solving problems is easy for me
EI18: By looking at their facial expressions, I recognize the emotions people are experiencing
EI19: I know why my emotions change
EI20: When I am in a positive mood, I am able to come up with new ideas
EI21: I have control over my emotions
EI22: I easily recognize my emotions as I experience them
EI23: I motivate myself by imagining a good outcome to tasks I take on
EI24: I compliment others when they have done something well
EI25: I am aware of the non-verbal messages other people send
EI26: When another person tells me about an important event in his or her life, I almost feel as though I have experienced this event myself
EI27: When I feel a change in emotions, I tend to come up with new ideas
EI28: When I am faced with a challenge, I give up because I believe I will fail*
EI29: I know what other people are feeling just by looking at them
EI30: I help other people feel better when they are down
EI31: I use good moods to help myself keep trying in the face of obstacles
EI32: I can tell how people are feeling by listening to the tone of their voice
EI33: It is difficult for me to understand why people feel the way they do*

2. Wagnild and Young (1990)'s Resilience Scale, validly translated into Hungarian (7-item Likert scale). Used with purchased license from The Resilience Center (PO Box 313, Worden, MT 59088-0313).
RES 1: When I make plans, I follow through with them.
RES 2: I usually manage one way or another.
RES 3: I am able to depend on myself more than anyone else.
RES 4: Keeping interested in things is important to me.
RES 5: I can be on my own if I have to.
RES 6: I feel proud that I have accomplished things in life.

RES 7: I usually take things in stride.
RES 8: I am friends with myself.
RES 9: I feel that I can handle many things at a time.
RES 10: I am determined.
RES 11: I seldom wonder what the point of it all is.
RES 12: I take things one day at a time.
RES 13: I can get through difficult times because I've experienced difficulty before.
RES 14: I have self-discipline.
RES 15: I keep interested in things.
RES 16: I can usually find something to laugh about.
RES 17: My belief in myself gets me through hard times.
RES 18: In an emergency, I'm someone people can generally rely on.
RES 19: I can usually look at a situation in a number of ways.
RES 20: Sometimes I make myself do things whether I want to or not.
RES 21: My life has meaning.
RES 22: I do not dwell on things that I can't do anything about.
RES 23: When I'm in a difficult situation, I can usually find my way out of it.
RES 24: I have enough energy to do what I have to do.
RES 25: It's okay if there are people who don't like me.

THE CHALLENGES OF THE SHARING ECONOMY USERS AND THE IMPACTS OF PANDEMIC (COVID19)

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ABSTRACT
The sharing economy is a growing platform, as well as a new business model derived as part of the modern age, digital economy. During this renovation, the leading players in the sharing economy start facing several issues, especially comparing the traditional economy. During this research, the sharing economy and gig users' challenges are identified in detail. Furthermore, the study indicates the effect of the current pandemic crisis (Covid-19). The changes before and after the pandemic impact are also discussed. Therefore, the main focus area refers to the gig economy users and pandemic crisis on sharing economy.
Keywords: *covid19, entrepreneur, gig economy, gig economy users, independent contractor, pandemic, sharing economy*

1. INTRODUCTION

The fundamental concept of trade is changing dramatically. It also derives from the new aggregate demand at the global scope. The sharing economy is a unique concept that gets essential day by day. The concerns about the new system attract new entrepreneurs rapidly. It also opens new doors to people to earn money. The sharing economy is one of the trend areas in the early 2000s. It is highly possible to hear the sharing economy with further names. Such as collaborative consumption or peer-to-peer economy. Practically, sharing economy targets the means of the shares, swaps, and the things that can be idle or expensive to obtain. Critically, it derives from the person-to-person transaction. The gig economy refers to the individuals or initial actors in part of the sharing economy. The name of the "gig" expresses as any work within a specified time frame. In this discussion, gig economy users indicate an independent individual working for a specific period of a given time in the free market, such as Uber drivers and Airbnb renters. On the other hand, the main objective of the study is to analyze the challenges of gig economy users that are expected to face after the pandemic crisis (Covid-19).

2. COMPARISON OF TRADITIONAL ECONOMY AND SHARING ECONOMY

There is a distinct shift from the traditional economy to the sharing economy since the last decades. Chohan (2020) states that the sharing economy has born into the digital economy during the 20th century. There is a distinct time difference between traditional theories and today's digital economy. According to the author, the digital economy is a digital age with its major players and discussions, such as "globalization, social media monopolies, cryptocurrencies, digital governance, and the cashless society." Beyond these significant implications, the author highlights the existence gap from traditional theories besides on digital age' bringing. Apart from the traditional economy, the monopolistic market is also existing in the digital economy. Few big firms monopolize the markets and even sub-markets. For example, google leads to search engines as well as Facebook leads for social media. Consequently, the author highlights the need for incumbents' interference in the market for reshaping the monopolization power positively. Shankar (2016) underlines how sharing economy distributes the channels comparing to the traditional economy. The main difference is that the traditional economy shifts the goods or services through companies or a middleman. However, sharing economy reshapes this path by eliminating firms as well as creating a direct connection with customers.

Therefore the distinct line between suppliers to customers is blurred as because customer-to-customer relation becomes without any middleman. Another difference compared to the traditional economy appears on environmental and financial purposes. As proof, today, most of the users are eager to use mobile apps for ordering a taxi rather than calling the taxi company for the same request. The sharing economy also claims to be faster than the traditional taxi sector because several drivers might become to be part of this business model quicky. Simplycity and personalization create the premiere value of this new business model comparing to traditional business models. Mleczko (2017) compares the sharing economy and traditional economy in terms of the regulation patterns. The traditional economy already has substantial legislation and rules for the service sectors, such as taxi and hotel business. However, the same rules are not applied to the sharing economy based on its new business model, Such as uber taxi besides taxi service as well as Airbnb besides the accommodation sector. The issue arises with the question of while the applied rules of the traditional economy could create a barrier for sharing economy as well as it helps to boost the sharing economy. Competition exists between the traditional economy and the sharing economy. Moreover, regulations play a crucial role in understanding the regularity position of two different economies accordingly. The author discusses in case the same rules apply to sharing economy. It could create a barrier for the competition within sectors, such as the taxi industry Mleczko (2017). In conclusion, the difference between the two economies shows how the traditional economy is negatively affected despite the new business model, sharing economy. Moreover, this negative impact raises the need for regularity for the sharing economy to leverage the local businesses within the traditional economy. However, the current research highlights that the need for adoption and learning progress is a more useful approach for such new upcoming trends and business models (Shankar, 2016).

3. THE CHALLENGES OF GIG USERS

This research seeks ongoing challenges that gig economy users face daily. In this section, the research endeavors to identify a couple of primary problems, such as social rights, discrimination, and regularity. Ravelle (2017) explores the similarities and differences in entrepreneurship within the concept of the "sharing economy." According to the author, the definition of gig user's employment status changes from country to country. Therefore, the author highlights that this variety of interpretations affects individuals' social protection, such as pensions. Another study also elaborates on the distinct identity of individuals in sharing economy. According to the research, individuals need to gain legitimate social rights; likewise, any workers in the traditional economy within Europe. The article states that the importance of particular social rights, such as pensions, maternity cover, and health insurance, on workers should be observed to create equity between the "sharing economy" and "traditional economy." (Forde et al., 2019). On the other hand, Ravelle (2017) states the disparity exists between single workers and corporate workers with an example of the "Airbnb" (hosting company), such as the aggregate position of Airbnb in the New York market. Moreover, corporate users of Airbnb are increasing compared to individuals in New York. However, the author highlights that corporate users create risks on single users because of stagnating the individual's revenue in sharing economy. Moreover, Edelman, Luca, and Svirsky (2017) exposes potential discrimination of ethnicity for gig economy users. The article primarily explores whether being African American ethnicity creates bias while booking a room through the Airbnb platform. The result shows that African American names have 8 percent less chance to be accepted of booking a room comparing to the White-sounding names. Secondly, there is a bias that African American users usually have fake accounts. Therefore, some of the requests for the Airbnb platform receive "conditional yes" by the hosts. Due to the author's research, it also brings an inverse relation between hosts that they are white or African.

Because receiving "yes" is likely possible for white ethnicity rather than Africans. The authors finalize their study by questioning whether to identify or ethnicity matters during Airbnb booking requests. Schor and Attwood-Charles (2017) also explore the possibility of discrimination based on ethnicity. However, the authors highlight the person to person discrimination in different fields. Airbnb guest rates show significant differences due to ethnicity. The scores for African American users are lower than white American users. There are also biases due to the same reason about "acceptance" and "rejection" by Airbnb hosts. Authors also investigate ride-sharing platforms such as Uberx and Lyft. The result shows that ethnicity appears especially on a waiting period of drivers that coming late comparing to ethnicities—the other discrimination claims on gender status. Due to the research, women passengers in ride-sharing platforms are taken longer distances comparing to the men. Therefore, women passengers are supposed to charge more compared to the men passengers for the same intervals. Also, the author highlights the mismatch on location by the Task-Rabit's user samples. TaskRabbit is a platform that people provide daily task services to customers, such as cleaning and handyman work. The result shows that particular neighborhoods are charged for higher prices. It shows that there are not regular prices for the same services depending on the region. Moreover, it claims that safety issue is an essential matter on this price differences. Airi Lampinen, Huotari, & Cheshire (2015) examines the individuals rather than the platforms. The observation of the users and interviews are exposed during the research. The article focuses on the platform, which leads single parents to meet virtually. In time, the platform starts converting itself into a network by meet-up appointments. The major challenge of the users is highlighted as "trust." Individuals are not comfortable when they need to identify themselves. The main argument of the article indicates that the users seek for privacy and information trust while sharing any information about themselves. The situation appears especially in such platforms that are not exchanging tangible services rather exchanging mental services comparing to ride-sharing or accommodation-renting. Hossain (2020) examines the challenges of the broader approach. Instead of individuals, the author criticizes the sectors that will face specific difficulties. The car manufacturers might face a decline in demand based on the increase in car-sharing companies. Furthermore, investment opportunities through hotels might monitor the reluctant growth thanks to lodging platforms, such as Airbnb. In terms of the users, research exposes anxiety and uncertainty. The hosts are supposed to accept the guests virtually through the platform after a request of the host. This fact creates such uncertainty. Moreover, the potential of reservation cancelation on the last day generates anxiety for guests. Laa & Günter (2020) specifically focus on the bike-sharing business centralized in Vienna. Authors generate comparison with a few other countries and outcomes in terms of its challenges. The study includes interviews by experts and an extensive literature review. Mainly, research focuses on regularity approaches, legal framework, permits, and contracts. The study introduces four leading startups and newly launched bike-sharing business in Vienna. Authors review these businesses and conclude that vandalism is one of the main reasons that users do not be careful in terms of usage of bikes and parking restrictions. Moreover, Vienna regulates the market with new rules, such as forcing the bikes with its vehicle identification number. Additional new regulations, such as a high amount of violation fees, trigger the company owners that running a business is not feasible anymore. On the other hand, the study includes the cultural differences which play a crucial role in these businesses. The percentage of people using bikes differs from cities to cities. Therefore, it is not vital to expect the same reaction by neither users and nor regulators despite bike-sharing businesses. The author also identifies that bike qualities are essential facts in terms of business efficiency (Laa & Günter, 2020). On the other hand, users require to register through application to be part of using bikes. In this matter, the information security subject raises by regulators during registration. Finally, these challenges, especially new regulations, limit the bike-sharing businesses in Vienna, although

these challenges might differ country by country (Laa & Günter 2020). Fleming, P., Rhodes, C., & Yu, K.-H. (2019) criticize the economic perspective of the sharing economy (digital platforms). The authors claim that these digital platforms are not rapidly growing—the reason beyond occurred by the neoliberalism approach. The main argument derives from the main characteristics of digital platforms, such as individualism, ultra-marketization. The authors match especially individualistic approach as it is a part of the neoliberal economic approach. The study claims that the size of labor-based digital platforms is small comparing to particular OECD countries. Moreover, the actual number of digital platforms are rarely seen despites that the media exaggerates the size of digital platforms. Even though the gig economy provides the flexibility of work, it also leads to volatility on financial imbalance for workers as well as risks. Finally, the research claims that the gig economy is a more capitalist based economistic tool comparing to employee-friendly structures, such as part-time or freelancer possibilities. Moreover, it is highly advised in the study that a legacy is an essential tool for classifying the gig users. Additionally, the new regulation should cover the fundamental subjects, such as bargaining power during the online contract or labor-based medical benefits (Fleming et al., 2019).

3.1. Employment Status Challenge Of Gig Users

Mujtaba (2020) states that there is an essential need for a clarification of the gig worker's as because they are counted as an entrepreneur or an independent contractor. Due to the research, online platforms named the workers as "independent contractors" instead of "employees" that supported by law. The author analyzed the relationship between entrepreneurship and gig workers' status for online platforms. According to the article, the reason beyond being in a dilemma in terms of "employee status" is the "micro-entrepreneurship" status. Due to the sharing platform owners, they carry the position of being entrepreneurship. Therefore, the users count as micro-entrepreneurship status. Cornelissen and Cholakova (2020) examine the gig users' status into two different categories. Firstly, the user's status is taken into consideration as personal benefits, such as employer securities and their protections. Secondly, the author also discusses the political and moral situation of the user's status. In both categories, the authors recognize the need for gig users' identity in terms of their legal status as being either "independent workers" or an "entrepreneur." Due to the author, there might be a decent classification of gig users' status if ideas, policies, and aims. Converge by the political decisions. The recent study by Hagiu and Wright (2018) shows that calling gig economy users as either an independent contractor or an employee is adopted within online platforms. In the case of the uber company, the reason behind this is being able to decide the working duration and choosing the customers through the Uber mobile application. The author also accepts this situation as a positive element of being independent contractors. On the other hand, the author also lists the adverse facts that lead to calling the gig users as an employer rather than an independent contractor. For instance, uber drivers have a lack of bargain power during their registration into the uber system. Therefore the drivers only have the right to accept the online contract. The uber company also controls the price mechanism per minute of a drive. On the other hand, Gleim, Johnson, and Lawson (2019) explore the type of workers in two categories, which are "sharing economy" and "direct selling." The research aims to expose the main similarities and differences between the two types. The authors indicate that the fundamental similarity of the two categories is as an independent contractor. The reason beyond this occurs by able to obtain supplemental income based on their preferences. Moreover, the findings show that individuals in both categories determine the amount of work, likewise the duration of action. Indeed, the research states that "direct sellers" have a better relation comparing to individuals in sharing economy in terms of "self-congruence," where "direct sellers" create more extended connections and loyalty with their customers.

On the other hand, individuals in the "sharing economy" obtain a higher level of commerciality where the scope of the potential market is broader due to online platforms. Luke, N. (2019) states the "importance of the gig users' rights." The author begins his study and analysis in Australia. His findings indicate that gig users underestimate the need and importance of their employee rights and employee benefits, such as superannuation, sick leave, and holiday pay. Moreover, his findings reveal that gig users are also being ignored by the minimum wage guarantee and any financial support for loans. These circumstances raise the question of whether gig users are an employee or contractor. The example of Foodora (online food ordering company) states that Foodora gig users are a contractor and not an employee. Because they have flexible work hours based on their preferences, however, it reveals that these benefits and employee rights are not valid for Foodora gig users. In the end, the outcome shows that the protection of contractors does not match with the Fair Work Act 2009. Foodora accused to paid compensation for their riders. The author highlights the need for consultancy or advisory with lawyers to seek his/her benefits, especially during the position of gig users. Consequently, the research states that the general classification of "gig workers" varies from country to country due to different reasons, such as the prevailing of "sharing economy" or legislative approaches. However, the research expects the vital development of the legal framework through the "gig workers" at both the European and national levels (Luke, N. 2019).

4. PANDEMIC IMPACT ON SHARING ECONOMY

The current pandemic Covid19 impacts the sharing economy gradually. The platforms perform to avoid potential risks. This research includes a couple of chances, such as financial impact, avoiding crowds, and safety. Conger & Griffith (2020) highlights the financial impact of the pandemic crisis in the sharing economy. During the crisis, Airbnb declared to lay off 25% of its employee, whereas Uber company indicated the loss of about 80% of revenue. Beyond these data, the author shows that expectations of a decline in the sharing economy are assumed by about 30% in two years unless valid solutions found, such as the vaccine against COVID-19. Currently, the only option for sharing economy platforms shows intensive care, such as Airbnb declares the period cleaning of 24 hours to 72 hours between per customers. Adversely, the pandemic crisis also brings benefits for the different fields of the sharing economy, such as Uber food delivery as people enforced to stay at home and ordering food online. Vynck, Carville & Chapman, (2020) exposes the severe damage to gig users through their investments. Today, several people devoted their financial savings for sharing economy, such as loans for cars or houses for gainful activity. The study clarifies that not only sharing economy companies are severely affected, but also the pandemic issue profoundly impacts gig users. Keller (2020) identifies the role of sharing business within the pandemic crisis. He states that the term "sharing" is the essence of the facts that might directly increase the infection risk. Despite that, repeatedly sanitizing entire vehicles is unfeasible. Therefore, the author highlights the importance of pathogen transmission that leads to the spread of infection. On the other hand, the uncertainty of customer trends is shifting amid pandemic. Lever (2020) exhibits social impacts that appear after the epidemic, such as urbanization. People started to stay away from the population density and as well as starting migrates to rural areas. This shift should be taken into consideration for sharing business strategies as the customer target was mostly located in capital cities. By the pandemic impact, sharing platforms are enforced to build "trust" and "safety" aside from "sharing" and "collaborating" that is used as the primary dimension of sharing economies. On the other hand, the pandemic effect is a potential for the ride-hailing business, such as car-sharing and bike-sharing, to avoid density. Moreover, the pandemic effect also plays an essential role in shifting the sharing economy into new fields, such as education and medicine, which are dominantly needed in the case of the pandemic periods. National Real Estate Investor (2020) examines the effect of the pandemic crisis in two sharing businesses,

which are co-working and co-living. According to the study, the Co-working business has impacted negatively as the pandemic crisis pushes people to work from home. However, co-living, in which the places where people are more enthusiastic about sharing familiar places in the same apartment, is less affected due to contract procedures. Because people usually signed long-term contracts. Overall, the topic is still controversial, and impacts are uncertain. Therefore, the study advises that this pandemic crisis can be supported with less damage by various attempts, such as applications on socializing virtually with cooking and sports activities. On the other hand, Furedi (2002) oversees the fear effect on people and their reactions. According to him, the hazard is the perception, probability of leading any activity that people obtained psychologically. However, the danger is not a physical fact like food poison. People's reactions are changing, and these reactions can quickly grow at extreme levels. Therefore people's opinions are much faster than actual needs that are advised by authorities. Especially today, issues firstly bring fear instead of focus on a solution. If we compare the situation with COVID-19 and people's reaction, we might observe final results which might be even dangerous against the protection purpose, such as, cleaning the vegetables with chemical materials in the belief of disinfection. The author also indicates the potential adverse effect in the future. People might observe the situation negatively. However, this approach can be changed adversely by the next generation. Today's attitudes are not stable and unchangeable. The same ideology can be applied to the relation between the current pandemic crisis and the sharing economy. The entire adverse outcomes might turn out by opening a new era with better opportunities. It can also reveal that people's reactions and perceptions might change contrary to today's beliefs.

5. CONCLUSION

Based on the studies included in this research, there are a couple of suggestions and hypotheses on the convergence issue of gig users. However, the practice of proposed solutions is rarely found. The reason may be derived by being the challenge itself that being fresh and newly started discussions. In general, gig users are expected to face a couple of central issues, such as a tax situation, social rights, competition, and legislation. Moreover, the question continually raises about whether the gig users are entrepreneurs or independent contractors. Furthermore, the current pandemic crisis has been shown as an essential threat or the digital economy, especially within the sharing economy. Most of the companies face critical financial damages as well as growing uncertainty. Meanwhile, users also face extreme difficulty, considering some of the users that are invested in this business model, such as loan payments for vehicles or residences. Consequently, the pandemic crisis directly threatens the future of the sharing economy, along with its extreme challenges. The inclusion of the users and first parties for further discussions would play a crucial role in terms of observing ongoing challenges' outcomes of the digital economy.

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CHALLENGES AND BENEFITS OF VIRTUAL TEAMS: A LEADERSHIP PERSPECTIVE

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ABSTRACT

Organisations employ members with different disciplinary and cultural backgrounds who, at the same time, represent diversity in age, gender, ethnicity and a wide range of other factors as well. These teams usually operate fully or partially virtually, using communication and IT tools to collaborate, share ideas and altogether perform their daily activities while being geographically dispersed all around the globe – complexity bringing increased virtuality to the team set-up. Virtual teams have several benefits, such as availability, diversity, better access to resources and flexibility, however the virtual working environment imposes several challenges on the team members. Thus, a virtual team set-up requires various sets of skills, competences and tools from both the leaders' and the team members' perspectives. The paper explains the concept of virtual teams, the benefits and challenges that arise in this specific form of team set-ups. The paper also explores the leadership aspects that affect the operation of these teams, and suggests how leadership should focus on team and individual levels and what the implications of technology-mediated leadership are.

Keywords: *Virtual Teams, technology-mediated leadership, complexity in team set-up*

1. INTRODUCTION

The digital transformation changed not only our everyday lives, but the nature of work and how organisations operate. The information and communication technologies transform the ways of working in many ways, starting from new organisational structures, utilisation of the global talent pool or fundamentally reshaping how team members work together on the same thing they did completely differently before. The first instance was enabling individuals to work together even if they are geographically dispersed, however the new information and communication technologies, such as enterprise social media (e.g. Yammer, Slack) or collaborative editing platforms (e.g. Microsoft Teams, Google Drive) joined the basic messaging and video conferencing tools to enable teams to come together, scale up in larger networks of teams and even creating self-managing teams (Larson and DeChurch, 2020). Virtual teams emerged as part of this phenomenon, providing benefits to both the organisations and the employees as well (Maruping and Agrawal, 2004). Virtual teams have several benefits that attract employers in applying these team set ups: working virtually is flexible, makes 24/7 working possible, reduces the overhead and rental costs at the company and at the same time remote working could also increase the job satisfaction of the employees. Being globally open due to limitless communication opportunities between different parts of the world, virtual teams are diverse, organisations can access subject matter experts in all areas, even if the knowledge they require is not present in their home location. Besides the benefits, there are several challenges in teams that mostly rely on virtual collaboration. Benefits can easily turn to challenges, if the team is not managed properly: if diversity is not managed well, if there is no trust within the team, conflicts and issues may arise. Bell and Kozlowski (2002) suggests that all benefits that are listed in the academic literature assume that virtual teams are well managed, thus highlighting the pivotal role of leadership in the success of virtual teamwork. Leading virtual teams is more challenging than conventional, face to face teams, since the lack of social interactions and interpersonal communications, it is harder to build trust, keep the members

motivated and develop them both individually and as a team. The paper focuses on the most important attributes of virtual teams and how leaders are affected by this new way of collaboration. The paper reviews the literature available and draws conclusions based on the academic research and studies published in this topic. The structure of the paper is as follows. Section 2 with its subsections highlight the importance of virtuality and the benefits and challenges these teams face during their operation. Section 3 explains how leaders are affected by the virtual nature of their teams – what focal points they have to focus on at a team level and at the level of the individual and what technology brings to their everyday lives. Section 4 concludes the claims and the research results.

2. VIRTUAL TEAMS

2.1. Definition

According to Cohen and Bailey (1997) a team is a set of individuals sharing the responsibility of the outcomes of their interdependent tasks, who are seen – both by themselves and others – as a complete social entity in one or more bigger social system, such as a department or a corporation. Ricketts and Ricketts (2010) defines team as a group of people, which was set up to work together on a common goal, while contributing via performing different tasks using their individual skills and providing support to each other and meshing their functions. The virtual team concept started to receive academic recognition in the early 1990's, with primary focus on describing virtual teams and highlighting their benefits as seen at Byrne at al. (1993) and Dess et al. (1995). However, as noted by Bell and Kozlowski (2002), the initial literature did not focus on the challenges and leadership implications of these teams. Virtual teams have the unique ability to work together while located across offices, countries or fully globally using communication and IT tools to cooperate and accomplish a tax or project without the need for meeting face to face (Berry, 2011; Bell and Kozlowski, 2002). As noted by Lipnack and Stamps (2000), virtual teams are usually small and task-focused groups of individuals, who mostly work in technology-mediated ways toward a common goal. This aspect of technology-mediation can also be found at Hovde (2014), who notes that a virtual team – to some extent – always uses technology, especially communication technology to interact within the team. The goals, tasks or the mission of the team does not necessarily differ in a virtual team compared to a conventional, face to face team, the basic difference is that – as Bell and Kozlowski (2002, pp. 25) stated – "*members of virtual teams are not physically proximal"*. At the same time this does not mean that the members of the virtual teams prefer this virtual cooperation, that may not be their first choice, however due to this geographically disperse nature of their location, they have to expect and accept this way of communication.

2.2. Virtual nature

Another important aspect of virtual teams is that their virtualness, i.e. the degree to which the team is virtual, is a complex and multidimensional construct. Even when two teams use exactly the same technologies in doing their work, one team meets regularly face to face, while the other mostly uses the email, chat software and other telecommunication technologies. Thus, the latter is more virtual than the other (Berry, 2011). To illustrate that nowadays almost all the teams can be considered virtual to some extent, Mittleman and Briggs (1998) categorised the virtual interactions as follows on the time and place attributes of different scenarios:

Table following on the next page

	Time		Place	
	Same	*Different*	*Same*	*Different*
E-mail across the office instead of face to face communications	x		x	
Instant messaging	x			x
Dedicated chat room on a network		x	x	
E-mail exchange in a multi-office setting		x		x

Table 1: Virtual interactions
(Source: Mittleman and Briggs, 1998)

All of the four scenarios shown in Table 1. use certain tools (e.g. email, instant messaging, chatroom) to collaborate, however these tools are used for different purposes. Yet, the teams using these tools can be considered virtual in these activities, even if the face to face component in the daily operations are also significant. This is the essence of virtual operations – it is not a black or white concept, it is a range, where almost any team, who uses any type of technology could fit in. However, using technology does not immediately mean that a team is virtual. When it comes to the virtual team concept, the general requirement is the geographical dispersity to a certain extent and reliance on computer-mediated communication. (Berry, 2011)

2.3. Benefits

Over the past two decades there has been a significant growth in the use of virtual teams, which is expected to continue in the future. The 2016 survey of over 1300 business respondents from 80 countries found that 85% deemed virtual teamwork essential to their job and almost half of these respondents reported that over 50% of the members in their virtual teams were from other cultures (RW3 CultureWizard, 2016). According to Dulebohn and Hoch (2017) this growth was influenced by globalisation, the need for rapid development and innovation, the better access to and quality of networking and collaboration technologies and the fact that special expertise is distributed all around the globe. The following sections show the benefits the virtual teams can bring to organisations, including flexibility, cost efficient operations, better utilisation of time and space and the ability to create teams that can maximise the expertise of the geographically dispersed talent pool.

2.3.1. Flexibility

Flexibility is one of the biggest advantages of virtual teams, which has many aspects to it as well. From the organisation's perspective, they can better utilise the time and space available to them, meaning they can be productive 24/7 due to time and location differences through electronic communications, simply as they can work on various tasks at various times. (Berry, 2011) As an example, if a person located in Budapest requires an 8-hour work from another colleague to perform the task given, if this other colleague is also sitting in Budapest, she can only start working one workday later. Should this colleague sit in San Francisco, the data would be ready the next day without time in waiting – similarly as if they would have been working in different shifts. From the team members' perspective, flexibility could mean better work-life balance, especially if they can also utilise remote working, which could potentially increase their job satisfaction (Liao, 2017).

2.3.2. Access to global talent pool

Besides the timing differences, virtual teams can resolve knowledge gaps that otherwise would be hard to fill. In many cases the advanced information and communication technology enables the organisations to bring experts from all over the world together in a virtual team, which could be more cost-effective and may not be even resolved in conventional face to face teams

(Maruping and Agrawal, 2004). Global talent means more diverse teams, which can arise from both their cultural, educational or simply different backgrounds. The studies in this field are contradictory whether diversity can be considered as a positive or negative attribute when it comes to effectiveness; the information processing theory (Simon, 1978) or the resource-based view (Barney, 1991) suggest that there is a positive correlation, while the similarity-attraction theory (Tajfel, 1974) or the social identity theory (Kirkman et al. 2004) found negative effects towards productivity. Although, these theories contradict in outcome, both of them suggest that diversity – if managed properly – could significantly contribute to effectiveness. Managing and leading diverse teams effectively is the key factor in its success. As Taras et al. (2019) notes, diversity of perspective and the resources brought in by the members can increase creativity and enhance problem solving.

2.3.3. Cost efficiency

Another aspect of virtual teams is that this set-up can save costs for the companies. Since virtual teams use information and communication technologies, there is no need to travel to meet in person or relocate colleagues who are living in different countries (Lipnack and Stamps, 2000). Companies frequently use videoconferencing tools, organise townhalls, all-hands meetings, where they meet frequently, however it is also common to organise quarterly face to face meetings in one of the central locations of the company. Due to the remote working possibilities that are frequently utilised in virtual teams, companies could also reduce their operational costs by not building or renting physical offices or only renting smaller spaces (e.g. an office with only 60% of the required seats). This reduces rental and overhead costs and could save money in travel-related expense reimbursements. (Choi and Cho, 2019)

2.3.4. Better and more diverse knowledge sharing

According to Cohen and Gibson (2003) most interactions, commitments and the outcomes in virtual teams are easier to document, review and store as these are archived automatically and electronically, which makes sharing and accessing the knowledge also more efficient. Harnessing the knowledge and talent 24/7 from anywhere in the world is another great attribute to virtual teams. Virtual teams have proven to have the necessary tools to perform tasks and utilise the diversity of their nature in different complexities. In case of less complex tasks, virtual teams using asynchronous communication media (e.g. email) could effectively manage their information and collaboration requirements. In case of complex and challenging tasks, virtual teams use synchronous and tightly linked media to facilitate collaboration, information richness and group decision making. (Bell and Kozlowski, 2002)

2.4. Challenges

The initial literature focused mostly on the benefits of the virtual teams, however there are several challenges that shall be overcome in this type of collaboration. The recent survey of RW3 CultureWizard (2016) showed that 41% of the respondents, who work in virtual teams (85% of the respondents) have never met in person and only 22% of the respondents received any kind of training on how to increase effectiveness and productivity in a virtual team. The lack of personal connections, the issue of different cultures and languages – which on one hand can be used as a benefit for the organisation –, the technological issues can both hinder the effectiveness of virtual teamwork and pose challenges to the team members.

2.4.1. Language

One of the biggest barriers can be due to different language skills, since many virtual teams operate cross-country, using one single common language (such as English). The different proficiency levels can create status differences between the team members and could also lead

to misunderstandings, misinterpretations and conflicts (Neeley, 2012). Reinares-Lara et al. (2016) also highlights that members of virtual teams, who are less proficient in this working language usually are less engaged in group discussions and exclude themselves from communication. Presbitero (2020) also found empirical support that skill of the common foreign language is positively and significantly associated with the individual performance of the virtual team member.

2.4.2. Lack of social presence

Virtual communication is highly reliant on the verbal communication; however, a significant portion of our communication is non-verbal. Loosing, or at least limiting the possibilities for non-verbal expressions causes misunderstandings, especially in written communication such as chatrooms or emails (Daim et al., 2012; Hollingshead et al., 1993). The other issue with the lack of social presence is the issue of engagement without face to face meetings, no team buildings, no real human contact with the colleagues – which can be as simple as a short coffee break in a common room of the office or a quick chat before the meeting starts. These simple interactions create trust, which takes crucial part in creating an engaged team, where members feel their social needs satisfied, however virtual teams many times lack this opportunity due to their geographically disperse nature (Walther,1995). Thus, virtual teams in many cases increase uncertainty as team members encounter first as strangers, which is not easy to transform in a virtual setting, leading to anxiety, negative feelings and mistrust (Glikson and Erez, 2019; Cohen and Gibson, 2003).

2.4.3. Technology used

Another hindering factor is one of the biggest advantages as well, which is the use of different communication technology, such as teleconferencing software. Substituting face to face communication with an online or electronic tool can distort the messages and make the misunderstandings and conflicts more frequent than in face to face communication. Similarly, technology requires certain infrastructural elements (i.e. continuous access to electricity, high-speed internet, etc.), which are not always available for everyone within the team. It is also important to find the best suitable tool to be used in a given situation. The "this could have been an email" era shows that in many cases a simple asynchronous form of communication results in better distribution of information and use of time, than organising a meeting for the same task and vice versa. Not choosing the correct tool could negatively affect the resource allocation and reduce the effectiveness of information sharing (Bell and Kozlowski, 2002). Kock and DeLuca (2007) investigated four US and four New Zealand groups and found that using technology increased the cognitive effort from group members to communicate their ideas to the team – at the same time having a positive impact of information sharing.

2.4.4. Culture

Being connected via virtual tools in a global setting, cultural considerations become inevitable in a team. When team members come from different cultures (which can be due to their nationality, religion, education, etc.), the differences in communication norms and rules for politeness, directness and knowledge exchange shall be considered. For example, in several Asian countries nodding during a meeting could simply mean showing respect to the speaker and is not the sign of acknowledgement or understanding. A study conducted by Leung and Tjosvold (1998) and Olekans (1998) about essays published on conflict management in Asia Pacific countries show that Australians tend to be direct, blunt as they care about honesty and transparency, while Thais avoid open criticism as that is considered rude and would not enter into conflict as that is destructive to the harmony of their relationships (Brew and Cairns, 2004).

3. LEADERSHIP OF VIRTUAL TEAMS

Leadership is a crucial element in realizing the benefits of virtual teams and at the same time can help the team overcome the challenges and exploit the underlying opportunities. The key characteristics of virtual teams from a leadership standpoint draw attention to two primary functions: performance management and team development. Monitoring team and individual performance is restricted in the lack of face to face interactions and at the same time – even in case of using videoconferencing or other tools – the typical mentoring, coaching and developmental functions are difficult to perform (Bell and Kozlowski, 2002). Besides these two functions, there are several other attributes in virtual teams that a leader shall focus, both on a team or an individual level in a virtual team setting. Section 3.1 and 3.2 summarise the findings of Liao (2017) on multidimensional leadership, while Section 3.3. focuses on the leadership implications of technology.

3.1. Leadership at the team level

At the team level, Liao (2017) and Bell and Kozlowski (2002) suggested that there are several factors that are especially crucial in virtual teams. One of these key areas is collaboration, where the leader shall act as a trainer and guide to the members and is responsible for providing the necessary resources required. This includes not only process shaping and development or resource allocation but building relationships within the team to ensure true collaboration (Kirkman et al, 2004). Another important aspect as noted by Mathieu et al (2000) and Liao (2017) is the role of shared mental models, where the role of the leader is to contribute to the development of these behavioural rules and guides (such as shared knowledge about how the team interacts or about the technology in use) via facilitating knowledge sharing and enhancing the interactions within the team members. Since the face to face interaction is limited in virtual teams, the leaders shall be open to a more collaborative shared leadership scheme as well, which can serve as a supplementary technique in a virtual setting. Shared leadership represents the process, where the team members influence each other, share responsibilities and make decisions collaboratively. This makes the task allocation more efficient, the team more productive and due to shared responsibilities and tasks, the team members may become more engaged even in a virtual setting (Hoch and Kozlowski, 2014). Closely related to collaboration is trust – which increase team engagement and could reduce the psychological distance in virtual teams, acting as a glue sticking the fragmented team together. Several authors in the academic literature (Jarvenpaa and Leidner, 1999; Maznevski, and Chudoba, 2000; Suchan and Hayzak, 2001) suggest a relatively contradictory approach to resolve the issues of mistrust: launching virtual teams with face to face kick-offs, noting that the in-person meetings are irreplaceable for trust building. In virtual teams – or especially in the era of travel bans and reduced travel agreements – this is not always possible, however as noted previously this is a common practice at companies to organise at least quarterly meetings or workshops, where globally dispersed teams could meet. The emergence of conflicts within a virtual team is frequent – amongst others due to cultural differences, language barriers and the lack of social interaction, resolving these issues can be challenging for a leader. Since the issue resolution (should that be relationship-focused or task-focused) requires more from the leader of a virtual or partially virtual team than the leader of a conventional team and thus, they should pay particular attention to bridging members who are geographically dispersed and should focus on building strong relationships within the team as well (Cheshin et al., 2013).

3.2. Leadership at the individual level

Besides the team level, individuality and managing tasks and relationships on an individual level is also a focus area. The leader-member exchange (LMX) theory is widely used to focus on leader interactions with the individual team members and the quality of their relationships

(Dulebohn et al., 2012). According to Liden and Maslyn (1998), the leader's interaction with the individual team members is based on four dimensions:

- Affect
- Loyalty
- Contribution
- Professional respect

Affect means the mutual affection that a leader and a member have for each other, which is mainly influenced by non-task related aspects, such as chatting about some personal matters, customizing information in emails. Loyalty means the public support from each other, which can solidify the relationship between the parties. It can be strengthened in situations, where the leader defends his follower (i.e. does not put blame on her, instead comes to her defence and helps explaining the situation). When it comes to contribution, the direction and quality of task efforts the leader shows towards the team member is a crucial factor. Simple techniques, such as private chats about the needs and questions of the follower, providing constructive feedback or setting personalised work goals could strengthen their relationship and would make the performance of the individual more effective. In the case of professional respect, the role of trust is also a crucial factor as leaders have to be confident in the team members' abilities, skills and knowledge, while the members shall also acknowledge the leader's abilities. As noted in case of contribution, personalised goals, providing guidance towards completing their tasks can help utilising their individual strengths and knowledge.

3.3. Leadership implications of technology

Technology always affected leadership, the new ways of collaboration – such as the introduction of telephony services or emails to everyday work in the past century, which now seems the most everyday phenomenon – imposed challenges on leaders and team members to figure out how to exploit the opportunities of the new kind of communication media. Team members have to overcome complexities of these technologies and new processes, which have to be understood, accountabilities and protocols has to be set up and non-compliance sanctions shall be communicated as well (Berry, 2011). With the shift to virtual work and virtual teams, the leaders need to focus on how to compensate for the challenges their followers face due to remote communication, diversity, etc. At the same time leaders have the ability to shape the technology practices to help their followers cope with these challenges via shared leadership, team formation technologies and relationship building within the team. This also means shaping the ways they send and receive information and provide feedback or gather data while relying on information and communication technology (Larson and DeChurch, 2020). Technology can bring new ways of team formations, and digital technologies can shape the leadership structures and the interactions during team formation may influence who will emerge as a leader in the team. The leaders can also use the team formation technologies to manage boundaries, determine the team members, define phases of the teamwork and re-evaluate the membership periodically. According to Cohen and Gibson (2003) the formation activities shall include establishing easy communication, technology training so the technology to be used can be understood and explicit norms and expectations are set-up. Team formation now does not only mean creating teams from human resources only – there can be synthetic team members, whose roles and responsibilities shall be defined together with the limits of technology, where the human team members need to take back the control (Larson and DeChurch, 2020). Technology – as the integral part of virtual teams – provides new opportunities for leaders in redefining how performance is managed or tracked. There are several platforms (as simple as timesheets) that can help as the administrative tool for tracking the actual time spent on projects, and there are several technologies, which can track the progress real time.

The leaders have to know how to combine these technologies with more in person strategies – i.e. one-on-one conversations, personal check-ins or regular reporting. Studies found that in case of less complex tasks, there is no significant difference between the performance of face to face teams and virtual teams, the challenge comes with the more complex tasks. However, this could be also overcome with the right choice of communication media, i.e. choosing synchronous communication for resolving complex issues (Bell and Kozlowski, 2002).

4. CONCLUSION

"Virtual teams are here, and they are here to stay." – Bell and Kozlowski, 2002, p.45

The nature of work is changing, the activities of organisations have become more global and technology based. Technology enabled faster change, created more complex and dynamic jobs, which were followed by organisational changes, implementation of new, more flexible and adaptive structures and ways of working (Berry, 2011). Virtual teams offer several benefits to organisations and became increasingly common at organisations. Virtual teams impose challenges on both the organisations, leaders and team members as well, however those organisations that are not willing or not able to apply virtual team settings lose a significant competitive advantage in the rapidly changing global economic and social environment (Berry, 2011). Since the effectiveness of virtual teams depends on the resolution of these challenges i.e. conflict resolution, skill development, insufficient communication, the role of a leader is crucial in the success of virtual teamwork. Leaders shall acknowledge these difficulties and establish a social presence in the virtual interactions and find new ways of building trust, respect and loyalty – the tools are there via information and communication technologies. This paper provided a literature review on the benefits and challenges with virtual teams, with a special focus on the leadership aspects of these teams. The academic literature presented varies from the early academic researches to the current, in some cases in press articles, thus providing a summary of all current views and researches present in this research area. In the academic literature there is still a gap on how team building, and development shall be done, what toolkits are available for the leaders as even the current research focused on more of the theoretical side of leadership with a special emphasis on the aspects of virtual teams.

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INNOVATION AND THE ROLE OF EMPLOYEE AGILITY - A CASE STUDY IN JORDANIAN BANKS

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ABSTRACT

Innovation and agility are interrelated phenomena that have been considered fundamental for organizational Survival, Success, and growth in the bank sector in the Hashemite Kingdom of Jordan. Employee Agility considers an important element of individual capabilities which may be leading to innovative output. However, the purpose of this study is to examine the impact of the employee agility on the innovation output in three banks. With attempted to extend the studies in the context of innovation and employee agility. To achieve these objectives, a questionnaire was developed and used to collect data by 100 employees. The SPSS Statistical program was used to test the hypotheses. The findings of the study showed that there is a significant effect on employee agility on innovation output in the banking sector. Furthermore, "proactivity" and "Adaptability" skills of the employee yields a significant predictive value for generating innovative behaviour in the workplace. Despite the plenty studies of innovation, this study is prepared to be one of the first studies that shed the light on the role of agility skills of an employee on innovation process especially at service sector with the aim to help the managers to develop and improve their employee capabilities and stimulate their innovative behaviour. As well as and due to the lack of previous researches focused on the study of the importance of the agility capabilities in the developing countries.

Keywords: *Employee agility, agile, Innovation*

1. INTRODUCTION

The rapid developments and growing global competition worldwide has led to a noticeable rise in complexity and rapid changes in the work environment, making it difficult for their leader to predict the future consequences of the organizations (Jaiswal, Neeraj& Dhar.2015). Innovation has become an essential tool to achieve success and long term survival (Anderson, K, & J. 2014). And agile is a 21st-century philosophy that means" be able to deal with new situations or changes quickly and successfully' (Sharifi, H. y Zhang .2001). However, the emerging concept of agility has been widely discussed in the manufacturing organizations with the aim to enhance the organization's competitiveness and be innovative (Rajan, 2012), when they witnessed rapid changes in the industry's environment (Alavi, S & Wahab, D. 2013). Moreover, in order to survive in banks today, having agility capabilities become a necessity rather than a purpose. Thus innovation accompanied by agility has become essential capabilities required to meet those unpredictable changes and gain a competitive advantage as well (Winby, S., & Worley, C. 2014). However, the process of addressing and responding to changes relies mostly on the employees who are considered the fundamental source of potential innovative capabilities (Kanter, 1988: Janssen 2000). Furthermore, agility at employee level refers to the extent in which employee can immediately respond to the changes in the work environment with the ability to exploit those changes for the organization's benefit. (Alavi et al., 2014; 2018) Therefore, the organization now days put a lot of effort to invest in their employees and improve their agility skills, furthermore, researchers give more attention to study the factors that

influence and stimulate innovative behaviour, therefore they called for more research models of innovation as dependent variable (Janssen, van de Vliert, and West 2004). As a result, previous researches have tried to study the determinants and the key influences of innovation as debated by Scott and Bruce (1984) and Van de Ven (1986), Janssen (2004). However, despite the plenty of studies on the innovation factors as agility in the manufacturing organizations, but there are scarce studies that have tried to examine the effect of employee agility capabilities especially in the service sector (Pitafi, A., Liu, H. and Cai, Z., 2018). Given the importance of innovative behaviour, the major motivation of this study is to improve our understanding of the processes by which innovation influences. By examining the role of agility capabilities of employees to gain deeper insights on the determinants of innovative output that would help to fill the existing gap in the literature. Therefore, this working paper aims to examine the influence of employee agility that may consider possible predictors of innovative output in the banking sector. Drawing on the study of the (Alavi, 2014) agility capabilities of employees consists of three main constructs (proactivity, adaptability, resilience) and the study extends the literature by developing predictions about how a specific agility psychological constructs will affect employee innovation behaviour in the workplace.

2. THEORETICAL BACKGROUND

2.1. Employee agility and innovation

Although the concept of agility has been defined from different disciplines and perspectives, all definitions agreed on the significance of the change adaptation process when referring to agility. Thus, agility could be considered as the ability to act effectively in a competitive environment in order to meet customer needs fluctuations (Gunasekaran, 1999). Agility defines as the quick and effective response to unexpected changes in the market (Alavi, 2013). In particular, the agility would be the ability in face, survive, and even take the advantage of unexpected changes or threats (Sharifi, H. 2001). While organizational agility refers to the ability of the organization's structure that allows firms to be infinitely adaptable and innovative without the need to change (Dyer and Shafer, 1999). Based on the studies of (Alavi et al., 2014), researchers deemed the agility capabilities as a multistage behaviour that starts with "proactivity", then "adaptability", and need "resilience". Individuals with high proactive behaviour are initiative people, identify the opportunities, and pursue them until the change happened. (Crant 1995) demonstrate that being proactive means be predictive of the work objectives. This kind of personality consider unique and is related to the need for achievement. (Crant, 1993). Furthermore, employees with proactive attitudes try to seek and create optimal situations with the aim to enhance the work performance. By knowledge obtaining and engage more in the work's management activates .eventually proactive employees' act by anticipating the changes in the environment and react with constructive changes. (Morrison 1993) Adaptability, mean the ability of the employees to convert or adjust their behaviour to fit new work procedures when changes happened in the work environment (Alavi et al., 2014; Liu, Li, Cai, & Huang, 2015). Resilience is the employee's ability to accept and improve changes in terms of interactions and behaviours with other employees and procedures in the work environment. (Nguyen, & Malinen, S. 2016). Some researcher emphasizes on the role of the organization in improving and facilitate such behaviours to ensure efficient use of its resources when dealing with work uncertainty. However, the link between these interrelated constructs, proactive, adaptable, and resilient have received far less attention in examining how it's affected in work environments. Companies with an agile mind-set must be innovative because first of all, they compete in a turbulent environment that requires meets the need and the want of the customers with innovative ideas. Second, the nature of the uncertainty and the rhythm of these rapid changes drive organizations to invest more in their resources to improve their capacity with the aim to meet thus changes in a way that ensure ultimately efficient and effective

procedures. (Pitafi& Cai, Z. 2018)Agile environments require skills from the employees and managers in order to share information efficiently and effectively to respond quickly to changeable market needs, use communication skills, joint decision making that expresses employee thoughts, etc., and all these requirements have redefined the concept of employee agility and clarify its effect on the innovative implementation process. Therefore, thus capabilities consider essential constructs of any agile innovative scheme (Dubey and Gunasekaran, 2015). Therefore it's important to examine employee's agility capabilities because employees with a high level of agility should have stronger competences to quickly express their thoughts and believes about new ideas generating to their managers when responding to critical situations in work in an effective and efficient way. Therefore, eventually, they will be able to be creative and innovative when they want to. However, this generates the main hypotheses of this paper:

- **H1**: There is a statistically significant impact of employee agility dimensions (Proactivity, Adaptability, and Resilience) on innovation output in work.

2.2. Research Model

With aims to answer the research hypotheses in explores the roles of employee agility dimensions in the innovative output, the research model was built as below.

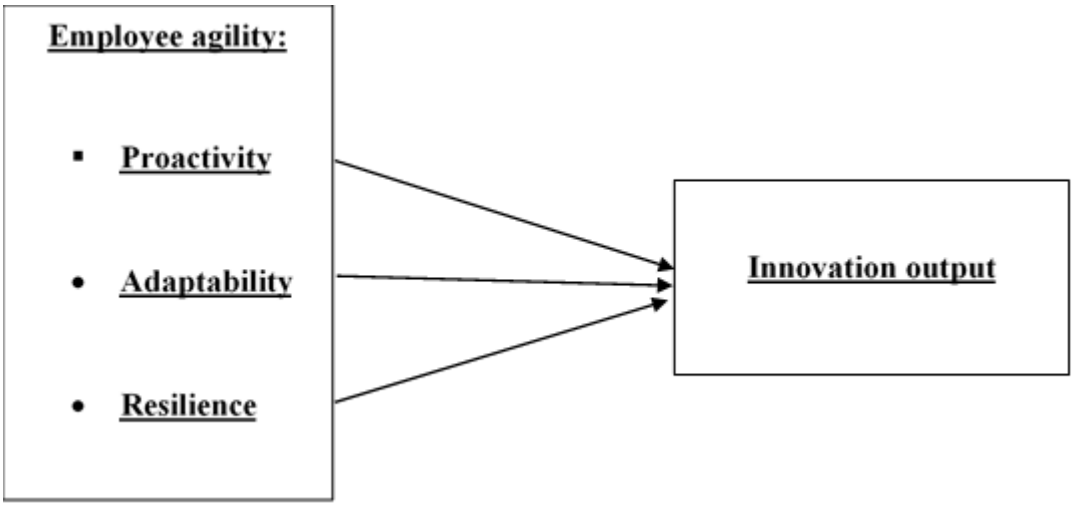

Figure 1: Conceptual Framework

3. RESEARCH METHODOLOGY

Based on the statement of the research objectives, the research can be considered as an exploratory study and quantitative approach was used to explore the nature of the relationship between the variables of the study and to derive the related implications or consequences of the phenomenon being studied. Furthermore, a survey strategy was adopted and distributed as case study in three Jordanian banks.

3.1. Study population and sample

The innovative strategies in banks have become an essential element to compete in the Jordanian financial sector. These can be achieved in the form of technological innovations, which aim to create and reorganize financial services through new channels, or innovations in the form of new business models and procedures. These innovation processes will comprehensively change the market and the work environment and daily procedures of employees with the purpose to reach and acquire more clients and reduce the total costs (Adner and Levinthal, 2001).

However, whether technological or social, all innovations forms consider crucial for pursuing competitive advantage and sustainability. It's known that innovation in the bank is not limited to specialists of employees or held in a specific department (de Jong 2007) therefore the population of interest for this study targeted the employees who are working in the functional departments like human resources, Business development, marketing, branches, electronic channels, etc., in three commercial banks in Jordan. In cooperation with the bank's administration of Human Resources, and after ensuring the full confidentiality of employee's responses and the distributing procedures, 100 questionnaires were distributed to the subordinates in paper form and we invited them by their emails using an online survey as well. Although the English language is the official language of conducting the formal procedures in Jordanian's banks, the questionnaire's items language were distributed in the English language follow by Arabic translation to ensure a full understanding of the items while filling. The research variables were measured using scales adapted from published studies to ensure validation. Measures Completed by Subordinates are: "Employee agility" with 12 items using Five-point scale ranging from "Never" to "Always", that measure employee agility, skills and how faster they are in responding to the rapid changing in the work environment, items consisted of three dimensions: proactivity, adaptability, and resilience adapted from (Alavi et al., 2014) as cited by (Cai, 2018). And the Innovation output questionnaire scaled developed by (De Jong & Den Hartog, 2010), the scale items measured employees' innovation output with six items, using a Five-point scale ranging from "Never" to "Always". However, in the end, only 65 responses were considered as valid.

3.2. The result of the analysis

3.2.1.Demographics descriptive statistics

Table 1: Demographics descriptive statistics

Percentage% and Frequency of employee					
Gender					
Male	**26**	**%40**	Female	**39**	**%60**
Age					
25 – less than 30 years	**32**	**%49.2**	30 – less than 35 Years	**15**	**%23.1**
35 – less than 40 Years	**16**	**%24.6**	40 – less than 45 Years	**2**	**%3**
Education Level					
BSC	**52**	**%80**	High Diploma	**3**	**%4.6**
Master	**10**	**%15.4**	PHD	**-**	**-**
Position. .					
Officer	**32**	**%49.2**	Senior	**33**	**%50.8**
Experience in the current position					
Less Than 4 years	**27**	**%41.5**	Between 4 to 6 Years	**12**	**%18.5**
Between 7 to 9 Years	**6**	**%15**	Between 10 to 12 Years	**2**	**%24.6**
13 Years and more	**2**	**%5**			
Total Experience					
Less Than 4 years	**16**	**%24.6**	Between 4 to 6 Years	**7**	**%10.8**
Between 7 to 9 Years	**13**	**%20**	Between 10 to 12 Years	**23**	**%35.4**
13 Years and more	**6**	**%9.2**			
Department					
Marketing	**15**	**%23**	Human resource	**16**	**%24.6**
Business development	**11**	**%16**	Branches	**19**	**%29**
Channels	**4**	**%6**			

The characteristics of the employees as shown in table (1). In regard to the respondent's gender, the results show that the male was 26 (40%), while the female was 39 (60%). Regarding the age, the results revealed that the most sample were with a percentage 49.5% fall between 25 – 30 years, while (24%) of employees fall between 35 – 40, this result may have occurred considering that the majority of employees are youth and fresh graduates. Furthermore, the educational level, the results revealed that the (80%) of employees are BSc Holders, and Master's degree reached (15.4%). Regarding the experience of respondents in their current position were divided as follows: less than 4 years (41%), while the 4 – 6 years (18%), meanwhile the 7 – 9 years (15%), and finally the total Experience of employees revealed that most of them were between 10 to 12 Years with %35. While the "Less Than 4 years of experience" results revealed with (24%) years as a first job for them. Most respondent were from the Branches department with 29%, who have direct connections with clients and service procedures.

3.2.2. Descriptive statistics

Descriptive statistics were done by showing how the respondents have rated the scales in the survey, this allows us to explore the main directions of the variable being study. Table (2) shows that the overall mean for innovation output is (4.18) which reflects a high level of existence for innovation consequences. The highest mean value is for the items (4, 6) with a mean (4.42 and 4.48). The items (4, 6) refer to how many employees contribute to the process of service development and the optimization process of the work, which eventually contribute in innovation generating in the banks. While item number (5) has got the lowest mean value (3.74) this items measured the ability of the employee to acquire new groups of clients, however, the reason is that the most employee in the functional department don't have direct connections with clients, therefore, they don't contribute in the process of clients acquiring, this process held only in the branches department.

Table 2: Innovation output descriptive statistics

No.	Construct	Mean	Std. Deviation
	Innovation output		
		4.18	.461
1	Make suggestions to improve current products or services?	4.23	.656
2	Produce ideas to improve work practices?	4.18	.659
3	Acquire new knowledge?	4.42	.659
4	Actively contribute to the development of new products or services?	4.08	.797
5	Acquire new groups of customers?	3.74	.776
6	Optimize the organization of work?	4.48	.589

Table following on the next page

Table 3: Descriptive Statistics of Employee agility

No.	Construct	Mean	Std. Deviation
	Employee agility		
		4.356	.384
Proactivity		4.01	.449
1	I look for the opportunities to make improvements at work.	4.26	.509
2	I am trying to find out more effective ways to perform my job.	4.22	.718
3	I let time take care of things that I have to do.	3.20	1.121
4	At work, I stick to what I am told or required to do.	4.37	.741
Adaptability		4.565	.490
5	At work, I can adjust to new work procedures.	4.55	.638
6	At work, I can quickly learn to use new equipment.	4.60	.607
7	At work, I can quickly learn to keep up-to-date.	4.62	.578
8	At work, I can quickly switch from one project to another.	4.49	.590
Resilience		4.492	.494
9	I am able to perform my job efficiently in difficult or stressful situations.	4.68	.562
10	I am able to work well when faced with a demanding workload or schedule.	4.58	.705
11	When a different situation occurs, I react by trying to manage the problem.	4.57	.637
12	I drop everything and take an alternate course of action to deal with an urgent problem.	4.14	.864

Table (3) shows that the overall mean for employee agility dimensions is (4.35) which reflects a high level of existence for innovation. The highest mean value is for the Adaptability dimension with a mean (4.56). And the highest value is for the items that measure how much employees can quickly learn to keep up-to-date, and quickly learn to use new equipment. While the dimension Proactivity has got the lowest mean value with (4.01), that measures the extent of the employee postpone of things that they have to do.

3.2.3. Hypothesis testing

H1: There is a statistically significant impact of employee agility dimensions (Proactivity, Adaptability, and Resilience) on employee innovation output.

To test the main hypothesis, multiple linear regression analysis was used to determine whether employee agility skills of the employee affect the innovation output in the Jordanian banks, and which dimensions have a significant effect, and the results are presented as below:

Table following on the next page

Tables 4: multiple linear regression analysis

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.683	.466	**.440**	.3453826

ANOVA

Model		df	F	Sig.
1	Regression	3	17.779	.000
	Residual	61		
	Total	64		

Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	.700	.494		1.418	.161		
	proactivity	.435	.109	.424	3.995	**.000**	.777	1.288
	Adaptability	.272	.118	.290	2.300	**.025**	.552	1.812
	Resilience	.110	.110	.118	1.007	.318	.635	1.574

In order to test the hypotheses and examine the relationship between the variables (employee agility dimensions and innovation output), a multiple linear regression model was used in which employee agility dimensions (proactivity, Adaptability, Resilience) were considered as explanatory variables and innovation output as the dependent variable. However, the result of the regression analysis reveals that there is a significant relationship between employee agility and innovation output. This can be inferred from the t value and its associate's p-value. Moreover, Agility dimensions of the employee can explain 44% of the variations in innovation output, which means that the strength of the relationship between employee agility and innovation consequences are moderated. From the table (6-1) we found the adjusted R square is (0.44), this means that the independent variables (employee agility) explain (44%) of the variations in the dependent variable (innovation output). Moreover, from the table (6-2), based on the (F) value (17.77) and the p-value (sig. =0.000), we conclude that the model is significant and valid and there is a correlation between employee agility of the mentioned relationship and innovation output. However, to verify the existing relationship between variables a multicollinearity test was carried out. And it is noticed from the table (6-3) that the "VIF" value for each of the independent variables is less than (10), the results of the collinearity statistics of "VIF" factor of the model showed that there is no multicollinearity within the data. Which indicates that the data is clear of the multicollinearity problem. Moreover, from table (6-3), we found that the dimensions that have significant effect on the generating innovation are the first dimension "proactivity" (t = 3.99, p-value =0.000), and the second dimension "Adaptability" (t =2.300, p-value =0.025). This indicates that there is a significant effect of the independent variables of employee agility dimensions on the dependent variable innovation output, and we can also notice that all items have a positive effect on the innovation.

As regression analysis results have shown, when employees have more agility capabilities, more innovation output will result. Based on that our results confirm the main hypothesis which indicates that there is a statistically significant impact of employee agility on innovation output.

4. DISCUSSIONS & CONCLUSIONS

Our findings have shown that employee with a high presence of agile capabilities is able to generate and implement greater innovative output in the banking sector. Furthermore, there is a greater presence of the proactive skills and adaptable skills between employees compare to the presence of resilience behaviours, which mean that employee in banks constantly looking for the opportunities to make improvements at work and constantly trying to find out more effective ways to perform their job. At the same time, our finding reveals that most employees are not able to behave innovatively in stressful situations or with demanding schedules. Furthermore, they mostly committed to their timeline work program which may affect their innovative consequences in their workplace. Therefore managers or decision-makers in banks should try to enable a more flexible and creative environment in the workplace to ensure a healthy work environment that helps the employee to be innovative and agile even in most critical situations. However, the importance of innovation in organizations has been received growing attention from scholars and continues to be one of the most interesting to researchers and practitioners. Despite the number of studies on innovation and its related disciplines, still, some gaps remain due to the factors that influence and stimulate innovation. Therefore, in this study we shed light on the role of agility skills of the employee in the banking sector, there are rare studies regarding this variable. Therefore the purpose of this study is to explore the role of employee agility dimensions in generating innovation in the bank's functional department in Jordan. Moreover, the literature extended with the aim to help managers to understand the importance of the factors that ensure promote innovation practices. And to advance our understanding regarding the importance of agility capabilities in the employment process in the banking sector. Furthermore, the findings provide directions for managers who need to designate the work environment with appropriate capabilities to ensure efficient behaviour and the ultimate innovation process. However, our research advances knowledge on how the agility performances of employees can be improved by developing the role of specific psychological characteristics. Despite the well-recognized value of agility, investigations on how to foster agility at employees' levels are limited. Therefore this paper has extended the limited published literature on employee agility. The concept of agility has been extended to the human resources in any organization therefore agility should be a part of the successful management, together with other capacities such as the alignment between the employees and their manager (Rawashdeh, L, & dory, T. 2020,).

5. LIMITATION

This study was conducted in the banking sector of Jordanian sample, however, future studies can also examine the employee agility skills in different sector such as telecommunication firms that relay the most on the agility skills of their employee to promote innovation. Moreover, there is only few studies that built a scale to measure the agility capabilities of the employee, future research could develop and examine new items to measure the agility capabilities of employee especially in service sector. This study examine the employee agility as independent variable, future research could investigate the role of agile capabilities as mediating variable that may use to simulate innovative behaviour for example employee voice.

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NATURE OF CONNECTION BETWEEN EMOTIONAL INTELLIGENCE AND ORGANIZATIONAL LEARNING

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ABSTRACT
The purpose of this paper is to explain the nature of the connection between emotional intelligence and organizational learning. After examining the academic researches in the field of organizational management and leadership, I've found that learning organization models have several keypoints referring to subscales of emotional intelligence models. In this conceptual paper, I describe the common detected interface of emotional intelligence and learning organization models. I draw a parallel between the models by examining the hypothesis about the positive correlation between them. I assume that The higher proportion of employees with high emotional intelligence, the easier it is for the organization to reach the phase of "learning organization. This study is the theoretical background, which helps to identify the proper models and surveys for future data gathering.
Keywords: *Connection, Emotional intelligence, Organizational learning*

1. INTRODUCTION

Organizational effectiveness has become an important research subject in organizational management. Looking at the recent studies, it is observed that effectiveness is one core competence of an organization; people need to be more creative and have to manage huge amounts of information. This information has to be transformed in a way that supports the learning process of the organization. Learning has become a crucial component of organizations. At the same time, employees need to work together more effectively and drive innovation; otherwise, the organization easily lags behind in the market. The life of the organization is determined by the manners of its members and the quality of its relationships. The organization does not have emotions, but employees being part of the organization express emotions during their life in the workplace. People working in an organization have different sets of goals. In pursuing such goals, they show different behaviors from attractive to ambiguous, like manipulating others. The emotionally intelligent organization invests in the development of people and understands that how well it uses its employees it leads to developing core competencies. Emotional intelligence is well-grounded as a crucial element to individual and team performance. Landy (1983) stated that 80% of actions in an organization involve some collaboration; however, establishing EI within teams will not necessarily lead to an EI organization. Learning organization theory and emotional intelligence models has a lot in common, without learning, organization repeat old practices and produce short-lived improvements. To able to reach being a learning organization, companies need creative employees with high inner motivation, openness and willingness to learn and develop themselves. Emotional Intelligence is not developed through knowledge but experience. Gardner (2013) states that learning from past experiences is one point that transforms companies into a learning organization. The fundamental learning units in an organization are working teams (people who need one another to produce an outcome); this is the "core learning capabilities" of teams (Senge,1990). When there is no inner drive for development -in the absence of learning, companies, and individuals simply repeat old practices, and improvements are short-lived (Garvin, 2013). Developing employees emotional intelligence leads to a higher level of learning in organizations.

2. THEORETICAL BACKGROUND

2.1. Emotional Intelligence Theory

Thorndike (1920) recognized that intellectual capacity only is insufficient to explain human competences and behavior. He was the first researcher who used the term 'social intelligence', which concerned the ability to understand and manage people and to behave carefully in human relations. The first model of intelligence concentrated on the adaptive use of cognition. Gardner (1983) introduced the concept of intrapersonal and interpersonal intelligence, which gave the foundation for later models of emotional intelligence. The models of emotional intelligence have been categorized into three models known as (1) ability model, (2) mixed model, and (3) trait model as different researchers defined EI differently. Salovey and Mayer (1990) created the first model of „emotional intelligence." It concentrates on emotional skills that can be developed through learning and experience (Lopés 2003); they theorized that emotional intelligence consists of three categories of abilities: appraisal and expression of emotions, regulation of emotion, and the utilization of emotions (Schutte et al. 1998). Appraisal and expression of emotions have two components: non-verbal perception and empathy. Regulation of emotion can be divided into two components: the regulation of emotions in the self and others. The utilization of emotions includes flexible planning, creative thinking, redirected attention, and motivation. Goleman (2000) published his book „Emotional Intelligence at Workplace"; according to his findings, there is four main domain of EI in his model: self-awareness, self-management, social awareness, and relationship management. In self-management, four main subcategories are distinguished: emotional self-control, accurate self-assessment, and self-confidence. Social awareness has three components: empathy, organizational awareness, and service orientation. Relationship management has nine components: influence, leading others, developing others, communication, conflict management, visionary leadership, catalyzing change, building bonds, and teamwork and collaboration. Goleman (1995) declared that EI increased with age and linked to maturity, and it could be developed through practice and training. While Salovey and Mayer (2003) approached the theory from the psychological point of view, Goleman was the first who created a connection with leadership, and still, his researches are the most relevant in this field. The ability model of EI was proposed by Mayer and Salovey (1997). The model determines EI as a set of abilities at the interface of emotion and cognition (Lopes 2016). They revised their first model of EI and gave more priority to the cognitive components. The new model consists of four branches of emotional intelligence: perceive emotions, use of emotions, manage emotions, and understand emotions. Each of the four domains was theorized to have multiple subskills (Waterhouse 2006). Mayer and Salovey (1999) created the Multifactor Emotional Intelligence Scale (MEIS), which included the factors mentioned above and a general total EI score. Mayer and Salovey later improved on their existing measurement and created MSCEIT (Mayer-Salovey-Caruso Emotional Intelligence Test). They considered EI as the following characteristics:

1. the ability to understand and integrate emotions with cognitions
2. the ability to be able to manage such emotions
3. the ability to appropriately control and regulate emotions
4. the ability to recognize, understand and empathize with the emotions of others
5. the ability to manage relationships

This model, compared with Goleman's model, is the more psychological approach to emotional intelligence. It is a reasonable basis for future academic researches and more suitable for quantitative analysis, while the Goleman model is more assimilate to business practices. According to Stein and Book (2000), individuals who are emotionally intelligent can naturally understand what others want and need; they are aware of their strengths and weaknesses; can

remain undisturbed by stress, and are generally regarded as having good 'people skills.' This concept can be easily connected to leadership topics as well, as modern leadership theories highlight the necessity of empowerment, which requires strong people skills. Gendron (2007) explains the EI concept is the ability to comprehend and apply emotions as a source of strength, creativity, and connection. Emotional intelligence is the management of emotions, the ability to influence the emotions of others, the sustenance of motivation, enthusiasm, and conscientiousness. In connection with the workplace, it is the skill to communicate effectively and coordinate emotions adequately (Goleman, 1997). The result of the popularization is that there is a broad scope of approaches to the topic of EI, from the Mayer-Salovey ability-based interpretation to approaches concentrates on psychological well-being. Comparing the domains of the trait-, mixed- and ability-based models (Table 1.) ability-based model by Salovey and Mayer is the least detailed one, with four main domains. The ability model of EI was proposed by Mayer and Salovey (1997). The model determines EI as a set of abilities at the interface of emotion and cognition (Lopes, 2016). They revised their first model of EI and gave more priority to the cognitive components. The new model consists of four branches of emotional intelligence: perceive emotions, use of emotions, manage emotions, and understand emotions. Mayer and Salovey (1999) created the Multifactor Emotional Intelligence Scale (MEIS), which included the factors mentioned above and a general total EI score. Mayer and Salovey later improved on their existing measurement and created MSCEIT (Mayer-Salovey-Caruso Emotional Intelligence Test). In the ability-based model, emotional intelligence is viewed as verbal intelligence, except that it operates with emotional content. On the basis of the Mayer and Salovey model, Schutte and Malouff (1997) developed a new measurement scale for emotional intelligence. They thought there was a need for a brief validates measure, as all the previous measurements were long and complex. It is a set of 33 items scale, which resulted in the same sub-scales as Mayer -Salovey model. The availability of this test simple and in Henriett Nagy (2010) validated the Hungarian version (AES-HU) of the test. Ability EI (or cognitive-emotional ability) regards emotion-related cognitive abilities measured via maximum-performance test; it has a psychological dimension; however, the assessment should be measured in a context of area where participants plan to apply their EI knowledge, like leadership or job satisfaction. The correctness of responses is not evaluated by him/herself, as it is the case for personality questionnaires, but it is determined on the basis of an external criterion of correctness. The ability-based model by Salovey and Mayer has the least components and has no specific relation to the working environment. Trait EI (or trait emotional efficacy) concerns emotion-related self-perceptions measured via self-reports (Petrides, 2011). Trait EI belongs to the realm of personality, and ability EI belongs within the domain of cognitive ability. Mixed-models combine different aspects of personality, and the resulting mixture of traits, dispositions, skills, and competencies is labeled emotional intelligence. Measuring emotional intelligence at an organization level is more a reflection of the employees about their working environment than measuring job-related competences. It is the type of measurement rather than the theory that determines the model (K.V.Petrides, 2000). To describe the relation of emotional intelligence and learning organization, I use the ability-based model as it has the easy-to-access function, and the measurement approach is a considerable advantage in these models, as self-report data are faster accessible, mainly when it is used multi-method combining with other self-report data.

Table following on the next page

Table 1: Comparison of EI models

Trait Model by K.V Petrides	Mixed model by Goleman	Ability based model by Salovey and Mayer
WELL BEING	**SELF AWARENESS**	**PERCEIVE EMOTIONS**
Happiness	Emotional self-awareness	**UNDERSTAND EMOTIONS**
Optimism	Accurate self-assessment	**USE OF EMOTIONS**
Self-esteem	Self-confidence	**MANAGE EMOTIONS**
EMOTIONALITY	**SOCIAL AWARENESS**	
Empathy	Empathy	
Emotion Perception	Organizational orientation	
Emotion Expression	Service orientation	
Relationships	**RELATIONSHIP MANAGEMENT**	
SOCIABILITY	Leading others	
Emotion Management	Developing others	
Assertiveness	Influence	
Social Awareness	Communication	
SELF-CONTROL	Conflict management	
Emotion Regulation	Visionary leadership	
Impulse Control	Catalyzing change	
Stress Management	Building bonds	
ADAPTABILITY	Teamwork and collaboration	
SELF MOTIVATION	**SELF -MANAGEMENT**	
	Emotional self-control	
	Adaptability	
	Achievement drive	
	Trustworthiness	
	Conscientiousness	
	Initiative	

2.2. Learning Organization Theory

Organizational learning theory was defined by Simon in 1969, saying that learning consists of the development of insights and structural outcomes. There is a remarkable distinction between corporate and individual learning. C. Marlene Fiol (1985) states that organizational learning means the process of improving actions through better knowledge and understanding. Chris Argyris (1978) has made a significant contribution to the development of a learning organization, with the starting of the theory of action. "Organizational learning occurs when members of the organization act as learning agents for the organization, responding to changes in the internal and external environments of the organization by detecting and correcting errors in organizational theory-in-use, and embedding the results of their inquiry in private images and shared maps of organization." (Argyris, 1978). Huber (1991) examines organizational learning through four constructs: knowledge acquisition, information distribution, information interpretation, and organizational memory. He highlights the critical role of organizational memory, as the things that learned have to be able to recall from memory and constructs regarding information distribution and interpretation depends on organizational memory. Organizational learning is not only the sum of the employees' learning. It happens that organizations know less than their members (Argyris 1978; Huber 1991; Garvin, 1993; Senge, 1995). Organizations themselves are not able to learn; learning is gained through the employees.

Organizational learning only makes it possible when the organization creates the proper environment for learning. When individuals come together to analyze and use data obtained and interact with each other to achieve the objectives of the organization, this is when organizational learning happens. The learning organization refers to the structure created in the organization to enable organizational learning (Murat 2014). According to Watkins and Marsick (1993, 1996), there are four stages of the learning process: individual, team, organization, and society. Senge (1990) and Garvin (1993) were the first who moved from organizational learning to learning organization theory. According to Peter Senge (1990), building a learning organization is a 'lifelong journey.' Organizations learn only through individuals who learn, but individual learning does not necessarily mean organizational learning happens as well. The dimension that differentiates a learning organization from a traditional one is the mastery of five disciplines: system thinking, personal mastery, mental models, building shared vision, and team learning. Garvin (1993), in his research, highlights the question of how managers know when their companies have become a learning organization. He claims that previous researches are too philosophical, and the lack of practical implication is missing. He stated that there are critical factors, which are crucial for organizational learning and refers to these factors as the building blocks of the learning organization. The five blocks are systematic problem solving, experimentation, learning from past experience, learning from others, and transferring knowledge. As there are different approaches to a learning organization, some shared features can be determined. Yang, Watkins, and Marsick (2004) determined three common characteristics. All approaches assume that organizations are organic entities that can learn. There is a difference between the concept of a learning organization and organizational learning. The former means organizations that create the environment possible for continuous learning. Organizational learning is a collective learning experience used to acquire knowledge and develop skills. The features of a learning organization should be reflected in all levels of the organization. Two main learning organizational model (Table 2.) by Garvin and Senge are detailed by subscales, Garvin approached the topic more practical, while Senge gives the theoretical background in a holistic way. There has been no measurement tool built for the Senge model.

Table following on the next page

Table 2: Comparison of Learning Organizational Models

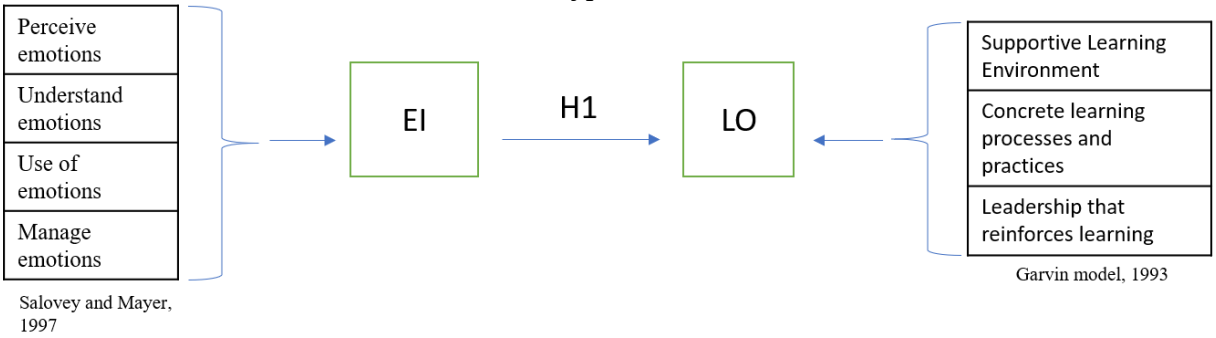
Garvin Model	Senge Model
SUPPORTIVE LEARNING ENVIRONMENT	**PERSONAL MASTERY**
Psychological Safety	Personal vision
Appreciation of Differences	Holding creative tension
Openness to New Ideas	Making choices
Time for Reflection	Using subconscious
CONCRETE LEARNING PROCESS AND PRACTICES	Reason and intuition
Experimentation	Compassion
Information Collection	Connectedness
Analysis	**MENTAL MODELS**
Education and Training	Reflective practice
Information Transfer	Openness
LEADERSHIP THAT REINFORCES LEARNING	Ladder of inference
	Balance inquiry and advocacy
	SHARED VISION
	Encourage personal vision
	Enrollment / Commitment / Compliance
	SYSTEM THINKING
	TEAM LEARNING

The Garvin model was built on a construct – "diagnostic survey"- which helps to determine how well a company functions as a learning organization. It is a diagnostic tool divided into three sections, each representing one building block of the learning organization (Garvin, 2008). The Senge model is a conceptual framework, which lays down the general conditions under farther other researches. It deeply analyzes each of the core concepts of the different constructs. As there is no survey linked to the Senge model, the Garvin model is appropriate to measure the level of learning of an organizational unit.

3. PURPOSE OF THE STUDY

The purpose of this study is to examine and explain the nature of the connections between emotional intelligence and organizational learning. The research question is, what are the connection points of emotional intelligence and learning organization models. Is it possible to enhance organizational learning by developing employees' emotional intelligence? According to the hypothesis, there is a positive correlation between emotional intelligence and organizational learning capabilities (Table 3.)

Table 3: Hypothetic Model



According to hypothesis 1, employees' emotional intelligence has a positive correlation to the level of learning in organizations. The higher proportion of employees with high emotional intelligence, the easier it is for the organization to reach the phase of "learning organization." One main activity of learning organizations is systematic problem-solving. It's not easy to establish the necessary mindset; employees must become more disciplined in their thinkings (Garvin,1993). In the ability model of emotional intelligence, the use of emotions for problem-solving is a crucial element of the whole EI score. If an employee can make use of his good mood, he will come to new ideas or conclusions much easier than those who are easily captivated by bad mood. (Nagy, 2010). Learning from others and experience is also a cornerstone of the learning organization, which requires a certain extent of reflection. According to Garvin, managers must be open to criticism and can't be defensive. Learning organizations cultivate the art of open, attentive listening. (Garvin 1993). Organization learning is a process of detecting and correcting the error. When the process enables the organization to continue its current policies, it is called single-loop learning. When employees began to question these underlying organizational policies, it is called double-loop learning (Argyris, 1977). It is complicated from the employee behavior side; not everybody is ready to question some well-used" norms. They risk getting in trouble, but in the long run, double-loop learning is what really takes the company forward. People with higher emotional intelligence are more initiative and self-reflective. They have an inner drive for development and ready to take actions without strong external pressure; they open for feedback and learn from past mistakes (Boyatzis, 1999). For appropriate learning, knowledge must spread fast and effective through the organization. Ideas have to be shared broadly rather than held to be successful. Organizations have several information transfer solutions, but absorbing facts by reading or seeing them demonstrated is not as effective as experiencing them personally (Garvin, 1998). Self-management is one major part of emotional intelligence, which includes- among others - achievement drive and initiative. These components of EI may drive employees more proactive in terms of seeking new knowledge and solutions. The leadership component is highlighted in all LO and EI models. Building emotional intelligence in an organization starts with leadership. As stated in learning organization studies: leadership is that reinforce learning within the organization. The first step is that managers need to provide a proper environment and necessary time for employees. Once this supportive and open environment is established, managers can facilitate learning units with explicit learning goals (Garvin, 1993). Chris Argyris (1977) mentions the "dilemmas of power," which represent important issues for leaders. According to the six points, managers have to be strong, but at the same time, admit the existence of dilemmas, they have to behave openly, but yet not controlling. How to be an advocate but still encourage confrontation of their views. Managers have to find a way how to respond effectively to employees' doubts in spite of their own. They need to learn how to manage fear and yet ask employees to overcome their fears and become more open. They need to understand how to explore the fear of understanding gear. Finally, they need to learn how to gain credibility for attempts to change leadership style when they are not comfortable with such style. For all these difficulties, the answer can be found in the development of the emotional intelligence of the leaders. One main cluster of emotional intelligence is relationship management. Developing others involves sensing people's developmental needs and bolstering their abilities. The most effective managers sense other's reactions and are able to adjust their own responses to move communication in the best direction. People with high EQ are good communicators, listen well, and welcome sharing information fully, foster open communication, and stay receptive to bad news as well as good. They have developed conflict management competence; they can handle difficult people and situations with diplomacy, encourage debate, and open discussion (Goleman, 2010.).

According to Peter Senge (1990), shared vision is one of the necessary blocks to build a learning organization. A shared vision is not an idea; it is rather a force in people's hearts, a force of impressive power. It is a vision that many people are truly committed to because it reflects their own personal vision. Visionary leadership is also a subscale of emotional intelligence. Those who adept visionary leadership competence, they are able to articulate and arouse enthusiasm for a shared vision and mission, to step forward as needed, to guide the performance of others while holding them accountable and to lead by example (Goleman, 1999). According to the emotional intelligence model, we can find the crucial elements of EI among the requirements of becoming a learning organization.

4. METHOD

For theoretical research, I used local and international literature in the field of knowledge management and organizational management. The academic articles were gathered from ScienceDirect, Scopus, and Elsevier. After collecting the different models for emotional intelligence and organizational learning, I gathered the key points for each subcategory of the model to find the common interface of the two topics.

5. FUTURE RESEARCH

According to the plans, I intend to demonstrate the hypothesis with statistical analysis, with a mixed method of survey and interview. For measuring emotional intelligence AES-HU survey will be used, because this is an ability model-based self-report test, easily accessible and brief. For measuring the level of organizational learning, I'm going to use "The Learning Organization Survey" developed by Garvin (2008). As I mentioned in Chapter 2, this is the only valid survey, which is practical and brief. I plan to choose employees of a Hungarian based multinational retail company. After gathering primer data with survey and interview, I plan to examine the employee's emotional intelligence level and investigate the nature of the connection with the level of learning in the organization after I will be able to prove the hypothesis and draw further conclusions.

6.CONCLUSION

After a relevant literature review, I found that organizational effectiveness has become an important research subject. The emotionally intelligent organization invests in the development of people and understands that how well it uses its employees it leads to developing core competencies. Organizations themselves are not able to learn; learning is gained through the employees. Organizational learning only makes it possible when the organization creates the proper environment for learning. The aim of the paper was to examine the nature of the connection between emotional intelligence and organizational learning. There is a common interface found in a way that the organizational learning model refers to certain subscales of the emotional intelligence model. Two measures were found to start to gather primary data. Among the emotional intelligence measures, I chose AES-HU, a validated 33-item scale self- report test. For measuring organizational learning, I chose Learning Organization Survey by Garvin. To prove the hypothesis 1 statistically, future research is necessary by obtaining primary data.

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DIVERSITY IN BUSINESS WITH THE INTEGRATION OF LABOUR MIGRANTS

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ABSTRACT

Several empirical findings as well as theoretical constructs support the fact that "diversity makes business sense". Researches about the potential contribution of culturally diverse employees suggest that companies cannot and should not swim against the tide, when it comes to labour migration and foreigner employees. The integration or inclision of labour migrants, or with other words, making them trustful, satisfied, committed and retaining them is a difficult task and constantly actual research area. This paper aims to contribute to this knowledge and provides practical implications about the integration of labour migrants. The authors present some integration-oriented models in the field of cross-cultural management. Our goal was to test these theories in the practice by qualitative, in-depth interviews. The method we used was an own-developed questionnaire in order to reveal the interviewees' own perception of integration or "inclusion", through their unique cultural lens. Each question indirectly asks on a cited integration theory. Based on the analysis of the responses, we drew up conclusions and present the theories' connection with each other if occur. The results are contextualized in the interviewees' cultural mind-sets. The used theories provide practical insights into the attributes and elements of integration through the eyes of employees, who are from diverse cultural background.

Keywords: *Labour mingrant, integration, diversity in business, in-depth interview*

1. INTRODUCTION

The question whether labour migration is a beneficial phenomenon on the global and national scale is not doubted anymore. Another known fact is, that it bears challenges concerning their integration within an organization. The difficulties originate from the diverse backgrounds of labour migrant employees. Although as researchers investigated diversity and its consequences in detail, they found and supported many times the fact that diversity indeed has enormous potential to improve organizational performance through greater efficiency, enhanced work processes and further merits as well (Gonzalez et al, 2009). Several concepts have been developed along the investigation of ways and issues of integrating diverse individuals (Thomas et al, 1996), yet there are several gaps in our knowledge in this field. As highlighted by literature reviewers (Shore et al, 2011), theoretical background of integration is extremely affluent long since, however, practical insights fall short. To address this problem, we gathered some well-established theoretical concepts in this paper and investigated them in practice. Offering an exclusive overview of diversity and integration literature would be impossible and it is not the aim of this paper. This paper filles gaps in the general academic knowledge by empirical examinations and discoveries. Although, as later explained, this paper also contributes to the theoretical base.

2. THEORETICAL BACKGROUND

Earlier, researchers approached diversity as a problem to cope with. Cope with bias, discrimination, exclusiveness and other negative phenomenon. Although as globalization evolved and labour migration has intensified, diversity was realized rather as an opportunity to exploit. Since the early 90's (Cox, 1991; Thomas et al, 1996), scholars have been discovering and analyzing means for integration. The theoretical development of the field is quite abundant to cover it by one paper comprehensively; the framework we applied for the present study is inclusive workplace and inclusiveness (Mor Barak, 2000; Shore et al, 2011). The concept of inclusion was initially developed by Mor Barak in the millennial. He had encountered employees with diverse characteristics (gender, skin color, culture, racial minorities etc.) who felt "excluded" from organizational culture or expected to assimilate to it (Berry et al, 1988; Mor Barak, 2015). As he puts, diversity may take many forms, categorizing them will not help to manage it, but investigating its manifestations and consequences will do. The outcomes can occur at numerous levels, in this study we reflected to the individuals' perception of their own inclusiveness into their working community. To gain a detailed picture of their emotions, we grounded our questionnaire by several, more or less, distinct models those were focusing on the experience and feelings of diverse people within working groups. Consequently, our concept is based on two fundamental pillars: diversity and inclusion. Diversity used to be grasped culturally. However, as sociology evolved, this perspective turned out to be extremely short sighting. Diversity is a summarizing term for differences in individual characteristics that might be racial, ethnic, physical, socioeconomic, gender identity, personality, genetic, etc. attributes. The list is endless, the key is that these features are "irrespective of job-related skills and qualifications" (Mor Barak, 2014). Nishi (2013) noted at this point that the relevant attributes might not be observable or unambiguous (e. g. educational level and intelligence). Inclusion in the community "…refers to the individual's sense of being part of the organizational system…(Mor Barak, 2014)." To synthesize and clarify the concepts, Shore et al (2011) warned that belongingness and uniqueness have equal significance. She cited the façade of conformity (Hewlin, 2009), that occur when someone suppresses his/her personal opinion or value and adjust to the organizational or supervisory expectations. Apart from these theories, we addressed further ones while conceptualizing and "grounding" our research. The need for such research is underlined by numerous empirical and theoretical findings. First of all, each human being has social needs to be satisfied (e. g. Maslow, 1943; Herzberg, 1968). Brewer (1999) stated such psychological needs are insured within workplaces with inclusive climate, although Nishii (2013) highlighted that empirical tests are still scarce. Psychologists also pondered the results of inclusion (Firth-Cozens & Hardy 1992) and found hard evidence that inclusion indeed preserves mental health for example, by reducing stress and procrastinate burnout (Shaufeli, et al, 1996). Researchers, who entertained economic viewpoints, has also argued for proper organizational climate because diversity is a pervasive feature that must be considered while strategy making and should be regarded as an opportunity for both individuals and an organization as a whole to learn and evolve (Chrobot-Mason et al, 2002). The benefits of inclusiveness were more precisely analyzed and supported later. For instance, Acquivita et al (2009) associated inclusion with job satisfaction. Cho and Mor Barak (2008) found evidence that perception of inclusion is a predictor of job performance and commitment. Den Hartog et al (2007) reported also strong correlation between performance and inclusiveness, emphasizing how fair and equal treatment of employees facilitates trust and reciprocity among the members of the group. On the other hand, insufficiently inclusive climate results in excessive costs for the company, in terms of higher absenteeism, turnover (Harvey, 2012) and more frequent conflicts (Herring, 2009). As we can see, inclusion is a definitely important and actual topic to investigate, not even to mention the accelerating population movements around the globe. Some specific research gap has been highlighted.

The existing literature should be enriched by various methodological approaches (Jacqueline et al, 2007; Shore et al, 2011). They called for interviews first of all. Secondly, theories regarding diversity and inclusion are overlapping, so addressing them jointly might produce a more holistic understanding of the issue (Buttner et al, 2012).

3. ACTUALITY OF THE RESEARCH

The goal of the paper is to introduce some more thoroughly researched theoretical constructs related to labour migrant diversity and integration literature and test them in practice. This effort is quite actual because, according to statistics, migration has become more diverse in terms of origin (Migration Data Portal). An increase has been indicated in the overall migratory balance of Europe is positive and it remained the main destination area with its inflow of 3,1 million migrants in 2018. This figure has been growing for the past 5 years (OECD). On the other hand, Europe's economically active population is forecasted to decline persistently, as expressed by the old dependency ratio (Eurostat). Labour migration improves a country's age structure, boosts significantly labour mobility and offers new, innovative skills and abilities from the perspective of the native working population at all times. Europe's aging population, labour shortage and the ongoing globalization make these contributions even more valuable. There were more events since the millennium (EU enlargements, great financial crisis) those have given new swings to labour migration. The most seriously affected ones are, both by emigration and immigration, Central and Eastern Europe. The region is stricken with significant asymmetric labour shocks: the highly-skilled, English-speaking generation is leaving, and there is a massive migration to Eastern Europe form the Middle East and Asia (Bite et al, 2020). Actuality is enhanced by the industrializing emerging countries, basically, in Asia. The insofar nascent Asian markets conceal a range of new business opportunities, apart from the accumulation of redistributable wealth of citizens. Conquering them requires to adapt to the needs and expectations of people, who has completely different cultural and individual characteristics as Europeans have. For revelation, various insights offered by migrant labourers have to be utilized. A third relevant and rather timeless aspect is concerning organizational and group performance in general. Researchers reported (Cho et al, 2008) that perception of inclusion through successful integration leads to commitment, enhanced work performance and lower turnover intentions (Nishii et al, 2009). We yet conclude it more actual now than before because examinations of diversity greatly ignored Central and Eastern Europe as a geographic area driven by the fact that it did not use to be such a popular destination as they are nowadays.

4. PROPOSITION

The objective of this research is to offer practical implications in association with the existing theories regarding inclusive workplaces and cultural diversity. "Inclusive workplace is an action-oriented model for integration (Mor Barak, 2015)": We planned to complement this model of Mor Barak by involving further theories related to integration and its circumstances. It is important to note that we do not question any of the theories but accept as, referring to the applied methodology, "ground" of our empirical investigation and resultant induction procedure (Haig, 1995). In the next paragraphs the used theories are briefly introduced. A community can be collectivistic or individualistic at distinct contexts and situations (Correll et al, 2005; Pickett et al, 2001). Optimal distinctiveness theory (Brewer, 1991) concerns the balance between feelings of uniqueness and belongingness. During the interview, whether "I" or "we" occur more frequently, we can conclude that the community is more collectivistic (prefers validation) or more individualistic (prefers uniqueness). The words interviewees use informs us what they regard as problems, neutral statuses or preferential outcomes (Mor Barak, 2015). Thus, we can find out more about the nature of these elements, where are insufficiencies or there if there is a satisfactory balance between the two desires, how employees interpret it.

Is inclusion a common goal or not? (Ramarajan, 2009). Sometimes to foster one's own inclusiveness, the person may withdraw his/her distinct opinion in order to adjust or assimilate to the organizational values or to the common sense (façade of conformity: Hewlin, 2009). How do employees feel about direct supervision? It is especially a crucial point for newcomers whether they feel themselves less trusted or somehow positively, e. g. mentored through their bosses' personal attention and advisory (leadership-membership exchange, Nishii et al, 2009). According to the similarity paradigms, people have higher propensity to agree and support individuals who they feel themselves more similar in terms of race, skin color, education etc. (similarity-attraction paradigm: Riordan, 2000). In this sense demographic similarities predict, horribile dictum determine inclusiveness (Nishii, 2012). The most illustrative example is when citizens from nations, those are historically enemies are less supportive toward each other (France-Germany e. g.) However, younger generations are less likely to act upon such things, then older ones. Another ground for similarity paradigms are gender identities (identity characteristics, Nishii, 2012). As far as genders are concerned, especially a couple of decades ago. many researchers developed theories about unequal treatment (Wagner, et al 1986.) or tokenism (Chatman et al, 2004). The focus has been usually on how men should approach women. Should they be polite, courteous at all fronts? Should they act differently around them? It also depends on the interpretation of women, because such behavior might suggest that women are held less capable or as someone, who requires special treatment and that is a sort of bias in the sense. There are controversial arguments whether common knowledge or distinct competences foster or hinder inclusiveness and integration (Ely et al, 2001). Commonalities mean more shared grounds for conversations or activities, so there is more room for connections to develop. Although differences can peak interests from counterparts, that can result in the same outcome. It is important to note however, that soft items, such levels of extroversion and openness are excluded from the described learning-effectiveness perspective of Ely and Thomas (2001). As an amendment, some researchers suggested that invitation into participation, team processes - those are related to individual abilities - mediate exclusion effect (Mohammed & Angell, 2004). Usually, there are some "ranking" among colleagues in workplaces, based on knowledge, seniority or other features (status characteristics theory and evident status hierarchies, Berger, et al, 1972; Ridgeway et al, 2006; self-categorization, Shore, 2011). The ranking can stem from constructive differences, as some colleagues might perceive each other as role models and in that case, employees are provided with extra motivation to work harder and achieve esteem from co-workers. But stereotyping can lead to categorization too. So the basis of such "order" determines whether inclusion is not hindered or it is. Larkey (1996) put that unlike ranking, categorization always leads to conflict. Conflict resolution is perceived as something that fosters inclusion and acceptance (Nishii, 2012). Although many empirical evidences suggest the opposite, namely that norms for openness makes relationships vicious (Jehn, 1995). Mutual trust is jeopardized by discussing problems above a certain extent (Brewer, 1999), while ignorance can attenuate destructive intensity in relationships (Fiol, 2009; Nishii, 2012). To what extent it disputes, both in term of topic and depth, should be discussed? Try to resolve them or just move on casually? These theoretical constructs served as grounding for our empirical analysis. Employees from various backgrounds, with various circumstances have tremendously various perspective of the world. That consists culture, religion, political orientation, habits, ritual, competences, relationships, attitude toward personal relationships or perception of time and achievements. The unique personalities endow unique soft skills and those are unique resources for the community they work in and for. It is inevitable to face the challenge deriving from fluctuating and migrating labour force of present times. To live up to it, first step is to map the current conditions and attitudes of workplace integration. It is our purpose and to contribute to the comprehension of integration and inclusive workplaces (Shore et al, 2011).

5. METHODOLOGY

Our proposed research method is qualitative, semi-structured in-depth interviewing with open-ended questions and on the other hand, we applied grounded theory methodology. Grounded theory is quite the opposite of traditional, hypothesis-driven methodologies. When formulating hypothesizes, researchers choose a theoretical framework and collect data, that will either confirm or reject the original belief. In contrast, grounded theory employs deductive reasoning. It is triggered by an opened question ("what is going on" or "what is the problem?" etc.) or collection of qualitative data. That is why grounded theory methodology is more suitable for qualitative investigations because those offer some flexibility that is required in human sciences (Strauss et al, 1997). As a start, data are broken down into "its elements", which are compared. During the process, new theories will emerge along the elements' conceptualization. So briefly, grounded theory is a systematic generation of theoretical frameworks based on existing theories and knowledge, those were already empirically tested. With other words, hypothesizes are the output of data collection or learning process and not the data is collected appointed by the hypothesis in advance. A fundamental drawback of the later order is that having a hypothesis seriously confines the range, scale of data collection and comprehension by "tube-kind" thinking. The nascent theory we had in mind is built up or "grounded" by several authors' works. Grounded theorists also have assumptions they can lean on, but those are regarded as "how or why do they work" instead as "they are true or false", where "they" refers to those selected assumptions. There are two main reasons why we have chosen this approach. According to its developers, grounded theory offers autonomy in generating concepts in explaining human behavior (Glaser et al, 1967). It is useful when theorizing is proceeded by a literature review, interviews and observations like in this paper (Ralph et al, 2014), when distinct ideas are found. Another important thing is that, as mentioned, we intended to fill a research gap in diversity literature by providing practical insights and researchers noted that turning to qualitative investigation such as interviewing would be quite timely and useful. As far as the interviewing is concerned, we applied a qualitative investigation, that is more interpretative and subjective, so personal attendance is desirable (Denzin et al, 2011). This scientific method focuses on personal meaning-makings of the environment. Personal experiences, artifacts, life stories, believes, thoughts, feelings, expressions, imagination are in focus (Deniz et al 2005; Wertz et al, 2011). After these information are highly subjective matters, proper and scientific interpretation of them demands background knowledge from the researcher (Given, 2008). Another argument for indispensable personal presence is that direct observation, description of the interviewee's unconscious, physical reactions is also a valid source of primary data and because the interviewer controls the way of the conversation to avoid misunderstanding or wondering to irrelevant matters during the event, that is a waste of time and resource. Here comes the next crucial point, that is the length of the questionnaire and interviews. An interview is always exhausting for both participants. In order to preserve thoughtful, honest responding and patience from the subject, we developed a relatively short, 10-questions-long survey. Although we were eager to engage in distinct matters from the core of the questions in the belief that semi-structured interviews trigger more reflection in the participants on the circumstances of a particular situation. Additional meaning-makings might serve with new traits for future studies. Briefly, we set up a relatively short questionnaire questionnaire to allow more time and room for the interviewees' unforeseeable input. There are also disadvantages of qualitative research methods in general. As responses are unique, findings can hardly be generalized or compared. Controversial research findings suggest that the interviewer presence might lead to dishonesty provoked by unanimity, but that was not proven in all cases. Personal interviews also bear geographic limitations too. But having those specifics set correlates with a more precise sampling and clear inclusion criteria.

The following inclusion requirements do interview subjects have to meet. People had to either work or study within a multicultural community. Multiculturalism entails the necessary amount and quality of unique personal characteristics; those are under the scope of our study - historical background, experiences of gender roles, perception of time, level of indulgence and further positivist dimensions of differences (Hofstede, 2001; Hall et al, 1990; Romani et al, 2018). They had to work closely to and interdependently on each other, in terms of common projects, team assignments etc.

Gender		Age		Place of birth		Religion		Ethnicity	
Male	19	10-19 years	0	Africa	2	Christian	15	Caucasian	14
Female	11	20-29 years	10	Asia	9	Muslim	6	Asian	9
		30-39 years	15	Australia	0	Jewish	2	Latino/Hispanic	3
		40-49 years	4	Europe	14	Buddhist	3	African-American	2
		50-59 years	1	North-America	2	Confucianist	3	Native American	2
		60+ years	0	South-America	3	Taoists	1		

Table 1: Characteristics of the interviewed persons

Educational level		Total years of working experince	
Elementary	1	0-5 years	8
Vocational	3	6-10 years	8
High-school degree	11	10+ years	14
College and/or University degree	15		

Table 2: Characteristics of the interviewed persons

Position at the company		Having ownership in a company	
Operational level	21	Yes	3
Middle level	6	No	27
Upper level	3		

Table 3: Characteristics of the interviewed persons

We interviewed 30 employees altogether, the length of the conversations ranged from 50 to 150 minutes approximately. The inbterviews were carried out personally, however due to the Covid 19 pandemic through an online video conference platform (eg. via skype). Table 1.-3. table presents the chaacteristics of the interviwed persons.

6. RESULTS

In this section we explained what were the common hints – codes - in the interviewee's opinions. In the sense of grounded theory, the repeated occurrence of codes during the conversations and their constant categorizing and comparisons make way for concluding practical implications (Charmaz, 2006).

Table following on the next page

Question	Conclusion
What is more important for you as a person: "validation and similarity to others" or "need for uniqueness and individuation"?	Optimality of distinctiveness changes as time passes.
How do you perceive your colleagues? As friends or as co-workers primarily?	The gap between colleagues and friends are obvious in the West, but is not supposed to exist in the East.
Embracing organizational values/practices does come together with suppressing individual values in your case? Is it bothering or easy to come over with?	Facades are most likely there, where they are latent.
Is direct supervision makes you feel less trusted/competent or it makes you feel that the boss devotes you or to the whole community special/personal attention?	The key for successful leader-member exchange is transparent communication and equality.
Do you like the "fugleman" in your working unit?	Social value relies on trustworthiness, expertise and extroversion.
Do you consider your colleague' nationality/gender when you approach him or her in any way? What is their impact?	Young people give less credit to stereotypes as well as cultural uniqueness's than older ones.
If you would have to rank the members of the group based on their knowledge/popularity/honor, where were you in that order?	Categorizations and rankings among employees are mostly determined by non-work related factors, such as politics, religion or personalities.
If highly esteemed members' opinion contradicts yours, do you yet share it or withhold and remain silent?	Opinion withdrawal is perceived as absurd and harmful for Western and Middle-Eastern societies, but natural and appropriate in the Far-East.
Do you think that men should help women in all fronts?	Certain gender-based differentiations are anticipated and welcomed at some locations, while the same can have negative legal repercussion at others.
If there is a conflict with a colleague do you talk about it with the involved people or you just ignore it and continue to work?	Ignorance of conflicts can benefit the workflow, but does not benefit the employees and the atmosphere on the long run.

Table 4: Summary of the questions and main conlcusions

According to the optimal distinctiveness theory (Brewer, 1991), people have to have a balance between feeling of uniqueness – distinctiveness from their community – and belongingness – being recognized by the community as a member. The building blocks of belongingness are loyalty and trustworthiness among others (Brewer, 2007), while individuation are fueled by

contributing in a unique, irreplaceable way into the whole (Snyder & Fromkin, 1980). It was also suggested that various contexts may make one of the two items temporarily salient (Correll & Park, 2005). Correll's and Park's point found validation during our interviews: all subjects agreed on the determining factor of time. Trust was mentioned as a crucial pillar cooperation is built on and it also ensures that inner cohesion that bridges over the distinctive characteristics and roles of the employees. Most of the interviewees' reported that showing their personal skills is a must, presenting something that is indispensable for efficiency and no one else can substitute. Although Arabic subjects highlighted that such high level of individualism is acceptable only if the unique skills are of extreme importance from the perspective of the task, otherwise an Arabic community would exclude the person. Anglo-Saxon subjects represented an utterly different opinion. Western employees in general uniqueness-oriented as oppose to the Asian ones, thus proportionately larger degree of distinctiveness makes them feel included and satisfied. The differentiation of nationalities is not the core scope of this paper, however could be an interesting topic to add on to this research. We noted also that subject in leader positions argued rather for uniqueness. They believed that a leader faces other requirements of inclusion then a subordinate: the team does not include the boss unless it does not prove its exceptional expertise - in some sense - as an evidence for authority. Beside unlocking optimal distinctiveness, trust divides collegiality and friendship according to the majority of the subjects. In certain more collectivistic cultures, improving business partnerships into friendships is anticipated. The emphasize lies on interpersonal relationships, not on group cohesion, although the proper quantity and quality of interpersonal connections is a must for inclusiveness (Reich & Hershcovis, 2011). The point of multiple identities theory is that everyone has different quality of relationships toward different people (Ramarajan, 2009), however the situation also matters. Like before, time bears significance: subjects reported that the more time they spend together, professional relationships ascend to friendships automatically. The depth of interpersonal relationships is in positive correlation with the feeling of inclusiveness and wellbeing at the workplace, because it fulfils fundamental psychological needs (see Maslow e. g.) affirmed by our examination too. Apart from time, the following aspects were cited as constituents toward friendship: common circle or interest, engagement in discussions of personal issues, time spent together off the work. Cultural background and location are of severe impact as well. Basically, Western interviewees stated that they mark an unequivocal line between friendship and collegiality, while for Eastern people, the two overlap and when the two perspectives collide, usually the location decides which party adapts the practice of the other. Leaders represented here a quite distinctive stance: they consensually believed that tight personal connection poses a huge threat to headship, which is not counterbalanced by its benefits at their positions. They rather keep things professional at all times. For them, the respect enables inclusion, instead of personal connections. In an environment, when minority groups' integration is insufficient, the affected one tries to fulfil their need for belongingness through the apparent embrace of organizational culture including supervisory expectations. However, it is counterproductive, because they achieve that by suppressing their own identities and values. This phenomenon is called the façade of conformity (Hewlin, 2009). Most respondents told that they never hold back their ideas, creativity and engage in conflicts with their supervisory, if necessary. Interestingly, Western interviewees who have worked in an Eastern environment reported that façade of conformity is quite common there, however, it does not restrain Eastern colleagues feeling of inclusion, because obedience and total assimilation to the working community is a must. Maybe that is the reason why Eastern subject did not approve at all. They do feel included when their personalities merge into the organizational culture. With other words, they willingly internalize corporate virtues, furthermore, they spend their whole lifetime working for the same company (lifetime-employment, Shshin-Koyo).

Oppositions between external expectations and personal commitments are tensive for Western employees (continental Europe and Anglo-Saxon regions) and as stated, they never submit. We concluded that most of them has never experienced facades. A third stance was presented by basically Middle-Eastern ones. We noted that the subject manner of speaking was quite confident in term of this adversity. This is the location where façade of conformity appeared and virtually hindered inclusion according to the perception of our interviewees from there, as predicted by Hewlin (2009). The leader-membership exchange (LMX) theory is used to analyze how leadership styles affects subordinates, in respect of their feeling of inclusion (Nishii and Mayer, 2009; Douglas et al, 2003). Examine each aspect of the various leaderships styles are beyond the framework of this study, therefore we choose to scrutinize only one feature: direct supervision (Shore et al, 2011). Nishii and Mayer (2009) claimed that differentiation between the members hinders inclusion, however high level of LMX supports it. It was confirmed that directly supervised employees perform better and feel advancement in their integration (Wasserman, 2008), but such favoritism damages group inclusiveness in general (Shore et al, 2011), which was claimed by many of our subjects as well. We encountered analogues opinions here. Each subject emphasized the importance of transparency and proper communication about the reason of special attention on someone, because, as we heard, colleagues usually surmise negative notions behind, such as nepotism. Contrarily though, the person who is actually treated exceptionally, felt good about it, as being coached or mentored. To sum up, the affected individual feels included and that its process of integration is facilitated and supervised personally by the boss. On the other hand, the inclusive climate of the community decreases through the negative assumptions attached to the special treatment, for instance as the other perceive themselves less valuable (Douglas et al, 2003). Some individuals bear exceptionally high social value and favored status in a group (Nishii, 2012). Manifestations of these are higher share of voice and level of inclusion as well (Brewer, 1991). These dominant and very extroverted individuals are likely prevail interactions, while the others are expected to assimilate and this phenomenon hinders inclusion (Wagner et al 1986). Through high share of voice signalizes high social value, we grasped this abstraction as "fugleman" (Jasso, 2001); one of our subjects on the other hand, called such persons "influencers". The fugleman person enjoys trust and admiration from their colleagues in case of indulgent cultures (e. g. Brazilian, Mexican), but if trustworthiness is doubted, respect turns into condemn instantly. For Middle-Eastern and also collectivistic cultures, the approach to and affect posed by the fugleman is dependent on knowledge and not on personality traits, such as humbleness and temperance. If the fugleman meets the set up requirements, he or she becomes capable of compromising the boss's authority, which was supported by each participant, through the greater value assigned to him or her respectively. The supervisor's reaction also affects the impact of the influencer. A straightforward objection would only strengthen the commitment toward the individual, however whether it enhances inclusiveness or not, we could not clarify. A sort of symbiotic partnership is suggested to be the wisest according to some of our interviewees: the boss may use the person as an intermediary, therefore utilizing its trust and influence over the community. The final consequence of people with higher social value is if they have certain attributes - varying by cultures – they increase the feeling of inclusiveness, but if not, negative, even hateful atmosphere is likely to evolve and ripple further. The inclination for greater belongingness or distinctiveness is affected by demographic and other similarities. According to the similarity attraction paradigm, people have positive attitudes toward individuals with for instance, same origin, gender, race, etc. (Byrne, 1971). We intended to find out to what extent and for whom are such characteristics – or others – considered when approaching colleagues for the first time. We concluded two things after the analysis of the sixth question. First, younger employees build much less on presumptions attached to personal characteristics. Younger interviewees stated that considering the other's being, ultimately undermines honesty, because one may not express

self freely, as concerned about the reception of its words. On the other hand, older respondents are more circumspect, they confirmed the paradigm. Senior employees argued that bearing in mind the other's ethnicity and being aware of its cultural taboos is rather beneficial than harmful when it comes to business dealings. They mentioned that religion, history and contemporary political discourse should be considered during negotiations, consequentially, they rather turn to their compatriots for instance, because they know their taboos for example. Secondly, we found that Asian cultures' representatives rather turn to their "similar" fellows in terms of age (Japanese), ethnicity (Palestinian) and intentionally avoid interactions with those outside of this circle. A Japanese participant mentioned that sometimes they are forbidden even to talk to seniors in the workplace. Inclusiveness is higher among similar people, especially in the Eastern part of the globe, but it is less significant for younger colleagues. As a consequence of personal characteristics – demographic, seniority, knowledge, experience – employees rank or categorize each other in the workplace (Homan et al, 2008; Turner et al, 2006). It was suggested that proper rankings can increase inclusiveness, however categorization never can (Larkey, 1996). We encountered that different cultures build on different characteristics when developing categories or rankings. Each participant reported of certain ranks in their working communities, however we encountered categorization only once. This case was deeply rooted in politics and cultural stereotyping. Muslim subjects felt extremely unfair the bias toward them, particularly, that Muslims are violent, disrespectful to women, and unwilling to adapt to the Christian culture. They divided their colleagues as the following: hostile-suspicious toward him; neutral ones and "fairies". One subject explained the last group as some people are more kind because they are aware of the humiliating and oversimplifying believes about them. In this respect, our fieldwork affirmed Larkey's (1996) results: categorization has negative notions. As far as rankings are concerned, several bases were mentioned by different people: trustworthiness, reliability, helpfulness, seniority, experience, knowledge, etc. Typically, hard items were fetched by employees from the Anglo-Saxon world and continental Europe, while soft attributes were by Latinos and Asian interviewees. No one told that rankings would harm integrational processes and inclusion, however the opposite was not undoubtedly supported either. An anticipated outcome of rankings and categorizations is opinion or creativity withdrawal (Shore et al, 2011; Turner et al, 2006). This is an instinctual act, as "less esteemed" individuals afraid of confronting highly regarded ones, even on a rational and professional ground. They may fear that the other takes counterarguments personally. This perception is established in the sociological concept of "face", which is incorporated in Hofstede dimension of power distance (Cambridge Dictionary, 2018; Hofstede, 1994). Our participants confirmed the fact of opinion withholding, especially the Asian ones. These participants measure their words and the circumstances more cautiously: who are they dealing with, how important is the issue at all, where and when confront if necessary, what will be the reception like. If they found the pros for arguing insufficient, they remain silent indeed. Their speech suggested though, that they do not find this compulsion right, they feel bad about the danger deriving from the egoism of the influential "antagonist" in the end. On the other hand, Western employees confirmed too but find the whole phenomenon absurd and extremely harmful. Interviewees in leader positions held it inappropriate as well, arguing that a boss should not stick to fixations, because that undermines corporate efficiency. They all suggested that showing powerfulness and saying "I am the boss" definitely damage inclusion, as subordinates feel disrespected by being turned down with irrational arguments. Several theoretical constructs and empirical findings suggested that gender based differentiation exists and affects business environment to a relatively greater extent in comparison with other visible personal characteristics (Herring, 2009; Ely, 1995); for example, status differences (Berger et al, 1972), similarity attraction paradigm in association with gender (Shapcott et al, 2006), climate for inclusion (Nishii, 2012). Considering the cultural background of our respondents, we concluded that female emancipation is less advanced as

going to the East, however whose opinions showed high variability were of Middle-Eastern subjects. Except for this location, Hofstede's gender-related statements proven to be correct yet in 2020. Accordingly, gender differentiation is less visible and daily in Europe and America, but if it occurs, its legal and social consequences are severe, while in the Far-East, differentiations are considered traditionally natural and not outrageous at all. In line with that, gender differentiation fosters inclusion in the East and hinders in the West in general. As for the Middle-East, the picture is more complex. Some interviewees thought that women are less reliable because they are more emotion-driven and it should never affect the work. A third approach was gender neutral. Consequentially, the respective tendencies require further, specific investigation in association with the Middle-Eastern cultures. Approaches to and consideration of interpersonal conflicts varies by locations and cultures (see e. g. Hofstede, 1994). Majority of studies proclaim the long-lasting benefits of conflict discussions and resolution attempts as they serve the understanding of the other side's perspectives and therefore deepens cultural knowledge, which in return enables integration of employees with diverse backgrounds (Fiol et al, 2009; Ely et al, 2001). However, other conflict concerning strategies found empirical evidences too. Jehn (1995) stated that dwelling on disagreements makes relationships vicious, while ignorance is a viable path toward smooth cooperation in the workplace. We found that, apart from certain exceptions, more power distant cultures claim the merits of conflict ignorance. We heard analogues responses from Middle-Eastern and African subjects, who experienced that the engagement into resolution makes them feel excluded as it casts a "frozen" atmosphere around them. Contrarily, in Europe, America and in some Latin-American countries, oppositions and instant but not forced settlements of disputes are welcomed. In correlation with that, unsettled debates erodes interpersonal trust and therefore leads to exclusion from the community, supported by Brewer (1991). Apart from the Far-East, resolution attempts are anticipated, but with various measure of circumspection. Employees from Eastern-Europe and Middle-East are less frontal, similarly to their attitudes toward opinion-sharing, described above. We had the impression that indiscretion is what actually makes them feel excluded, while their status suffers from the decreased trust resulting from buried quarrels, however no participants confirmed this belief unambiguously.

7. LIMITATIONS, FUTURE RESEARCH

The limitations of our research is methodological in nature. Glaser (1978) noted that in the cases of grounded theory, a data collection is confined by an emerging and not existing, well-based theory and that means the absence of conceptual depth (Benoliel, 1996). Qualitative studies usually produce ungeneralizable findings (Hussein et al, 2014). Knowledge is born through confirmation (repetition) and not by testing theories (that is what we did), even if they result in new ones (Polit et al, 2010). Our recommendation for future studies is to find confirming or refuting evidences to our own results. On the other hand, we encountered controversial elements in our gathered database, those need clarifications, for that end, we recommend a precise analysis both of the theoretical background and the related empirical findings, including our results as well. A precise and quantitative investigation would significantly reduce the ambiguity of the empirical evidence and can serve as a trial. Below, we summarized in bulletpoints, which questions we suggest for future studying. Reflecting to the grounded theory, this debates occurred frequently enough to develop codes from, but the respective opinions of the subjects were at conflict as a result of conceptualization stage of the method.

1) Do leaders have to present more uniqueness than belongingness than subordinates in respect of the optimal distinctiveness theory?
2) What contextual factors contribute to the transmission between collegiality and friendship; for example, time spent within the company or trust?
3) Can façade of conformity evolve under Eastern kind of corporate cultures?

4) Does high level of leader-membership exchange with only one employee erodes group cohesion?
5) How shall supervisors handle subordinates with high social value to increase inclusiveness?
6) To what extent does one's age affect its consideration of demographic characteristics?
7) Do rankings foster or hinder integration procedure of new employees?
8) How would unrestrained negotiations affect inclusion in case of Eastern cultures?
9) What is the relationship between gender based differentiation and inclusion in the Middle-Eastern culture?
10) Is immediate conflict resolution attempts lead to exclusion in Middle-Eastern cultures?

8. CONCLUSION

The aim of this research was to offer empirical findings about integration oriented models by testing these theories in practice (Mor Barak, 2015). Massive labour migration is a challenge to cope with but simultaneously, an opportunity to seize. We intended to produce some practical insights and understanding of the nature of integration driven by the fact that implementing the unique perspectives of newcomer employees with diverse cultural backgrounds and characteristics bears competitive advantage for companies and industries (Gonzalez et al, 2009). Previous studies suggested that inclusive workplaces correlate with lower turnover intentions, greater job satisfaction and higher performance (Cho et al, 2008; Nishii et al, 2009). However, such inquiries are absent if we reflect to Central and Eastern Europe. To address this gap we conducted our investigation in this region with employees working and living there. A self-developed questionnaire questionnaire was applied consisting ten open-ended questions. During the semi-structured interviews, the subjects were asked to tell their experiences and feelings about their own perceived inclusiveness in their working communities. We applied a holistic way in the belief that it is more beneficial if we apply the knowledge of the field comprehensively. Each interview served with unique findings; our final and general consequence is that, more "included" workers, that is to say successfully integrated ones, are more satisfied, committed and hard-working.

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DRIVER AND BARRIER FACTORS OF SUPPLY CHAIN MANAGEMENT FOR SMALL AND MEDIUM-SIZED ENTERPRISES: AN OVERVIEW

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ABSTRACT

Small and Medium-Sized Enterprises (SMEs) have not got appropriate attention in the Supply Chain strategy area, though they are integrated in big supply chains, having an important role in the economic growth of every country. The purpose of this research is to explore the role of drivers and barriers in the Supply Chain Management (SCM) implementation in the practice of SMEs. Small companies often operate with limited financial, management, knowledge, and technology resources. However, implementing the SCM strategy in the organization could secure a favorable position, build a competitive advantage as well as improve the organization's performance. Over fifty research papers, mainly from referred international journals have been reviewed to identify focus areas of research. Based on the review, variables for a future research agenda are being proposed. This paper has identified five key drivers (market pressure, social pressure, organizational culture, organizational characteristic, and corporate strategy) with 22 variables as a subgroup. Besides, we identified five key barriers (organization, financial, knowledge, technology, and outsourcing) with also 22 variables as a subgroup that can support experts to implement SCM. This research will contribute academically to provide additional literature for SCM focusing on SMEs and is also the basis of a future research investigating the effect of geographical structure and supply chain structure on the importance of drivers and barriers in SCM.

Keywords: *barriers, drivers, small and medium enterprises, supply chain management*

1. INTRODUCTION

Traditional SCM considers the forward flow of materials and the backward flow of information (Manzouri, et al., 2010). However, according to Chopra and Meindl (2016), SCM is part of the company's strategies in which to collaborate directly or indirectly between related parties to meet customer demand. Another definition from Stadtler, et al. (2015), SCM is a system of some organizations that are implicated, through upstream and downstream connections, in the different procedures and actions that create value in the type of products and services for their ultimate consumer. Based on the definitions above, SCM gave several strategic benefits to the organization process. Firstly, it can support reducing the production, delivery, and distribution costs, inventory, secures manufacturing flexibility, and drives for more productivity (Hsu, 2005). Besides, it also can streamline the manufacturing process, avoid the bullwhip effect, and improve the product and service quality (Yu and Cheng, 2001). Despite the several benefits for the organization, SMEs could not fully adopt the superior features of SCM strategy in comparison to large enterprises (Thakkar, et al., 2008). Research from Meehan and Muir (2008)

found that SMEs faced several barriers such as lack of skilled personnel in SCM, experience, lack of power, and trust. They identified that the fundamental reason was a lack of interest participating in the SCM strategy. SMEs currently have an important role in economic development due to an attractive and effective innovation system (Neagu, 2016). In the OECD countries, SMEs are the predominant form of enterprise, up to 99% of all firms, and provide as a main source of employment to 70% (OECD, 2016). The importance of SMEs in the supply chain and the specifics of SCM strategy implementation for SMEs requires specific research consideration. In response to the current problems of SMEs above, this research aims to achieve the following objectives:

1) To map the current state of research on driver and barrier factors of SCM implementation in SMEs.
2) To identify important directions for future research in SCM implementation for SMEs

In summary, to cover the objectives mentioned above, this study utilized a literature review method to examine the SCM implementation in SMEs in a broad picture. The paper is organized as follows: section two presents the methodology used which also includes the descriptive analysis of this literature review process. Section three deals with the driver and barrier factors of SCM implementation. Section four provides future research directions based on the current findings and limitations of our research.

2. RESEARCH METHODOLOGY

A systematic literature review was conducted to summarize the drivers and barriers of SCM strategy implementation for SMEs. A literature review is one of the research methods to understand the literature before shaping, argument, and justification. This type of literature review is used usually to answer a highly structured and specific research question (Arshed and Danson, 2015). Our research uses a procedure that is quite similar to the research conducted by Seuring and Müller (2008) in the process of retrieving and selecting the articles. The following phases were adopted from their research: sourcing, screening, analyzing the articles, and describing the sample characteristics.

2.1. Sourcing the Articles

For the literature review, the first important step is defining clear boundaries to eliminate the articles that are not directly related. In our sample, we used only the articles that have been in peer-reviewed scientific journals in the English language with specific research focused on drivers or barriers for SCM strategy implementation in SMEs. We conducted a structured keyword search in ProQuest (https://search.proquest.com/) and Science Direct (https://www.sciencedirect.com/) databases. We considered all articles published until 2020 containing the key word combinations and the number of retrieved articles as described in Table 1. We did a quick content check, to decide whether the articles included or excluded in the next research analysis phase. A total of 838 articles have been selected in this sourcing phase.

2.2. Screening the Articles

At this screening phase, we checked the abstracts of the papers and retained those that covered research about SCM in the SME context. In the beginning, only one of the authors did the screening process. The unclear abstracts were categorized as a backlog and being discussed with another author through an in-depth discussion about whether to exclude or include the paper for further processing. This screening process successfully identified 66 relevant papers. The articles that being gathered by search keywords in a broad term that included many articles that did not unequivocally incorporate with “SCM strategy” and “SCM for SME”.

No	Keywords Used for Search	Articles Retrieved
1	Barrier and Supply Chain	188
2	Challenges and Supply Chain	182
3	Driver and Supply Chain	175
4	Adoption and Supply Chain	199
5	Supply Chain and Small and Medium-Sized Enterprise	94
Total Number of Articles Retrieved		**838**
2nd & 3rd Phase	(Removing Duplication and Abstract Judgement)	54

Table 1: Number of Articles Retrieved based on Keywords Search

The focus articles will be classified into:

- **drivers** of SCM implementation (Chand, et al., 2018; Narimissa, et al., 2019; Akhtar, 2019; Saeed and Kersten, 2019; Micheli, et al., 2020; Sajjad, et al., 2019; Shabbir and Kasim, 2018 and Susanty, et al., 2018) and
- **barriers** of SCM implementation (Parmar and Shah, 2016; Zaabi, et al., 2013; Jayant and Azhar, 2014; Majumdar and Sinha, 2018; Mafini, 2016; Govindan, et al., 2013; Gupta, et al., 2020; Rahman, et al., 2011; Manzouri, et al., 2010; Farooque, et al., 2019; Dubihlela and Omoruyi, 2014; Salami, et al., 2013; Fawcett, et al., 2008; Narimissa, et al., 2019; Masete and Mafini, 2018; Sajjad, et al., 2019; Gorane and Kant, 2015; Meehan and Muir, 2008 and Ozen, et al., 2020).

After the iterative process of analysis, a total of 54 final articles were selected as the final sample (Table1). Figure 1 summarizes this literature research process.

Figure 1: Structured Literature Review Process (Source: Own Development)

2.3. Analyzing the Articles

In this phase, we extracted and documented the information from 54 articles and utilized content analysis to make sure to provide valid inferences from texts to the context of its use (Krippendorff, 2004). Hence, we always discussed if there is a doubt for further decision. The following questions should be answered by each article:

- What year and which journal was the article published?
- What kind of driver or barrier factors for SCM have been identified in the article?
- Which industrial sector is the main focus area?
- Which country is included in the context of its research?
- Does this article relate to SMEs as the main focus?

2.4. Sample Characteristics

The characteristics of the selected 54 articles are described by the distribution of publication year, journal, and the context of countries. It can be seen from Figure 2 that the research period of 2005-2020 shows a growing research interest in our focus area.

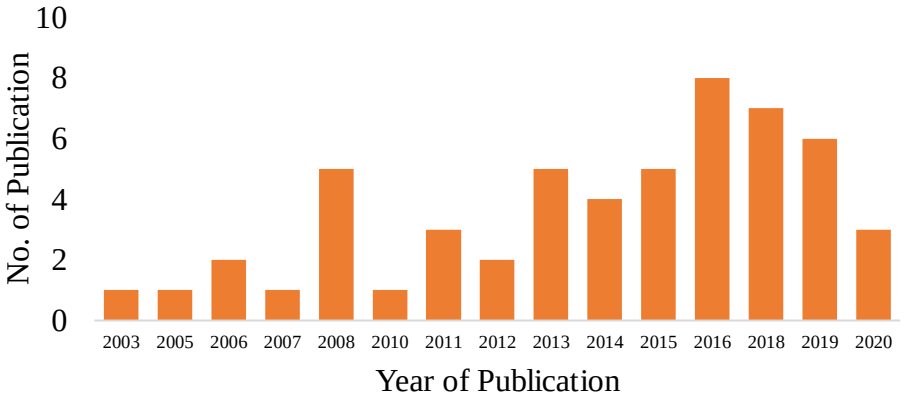

Figure 2: Distribution of Articles per Year

Furthermore, the selected articles come from a broad set of journals (Table 2). Figure 3 shows the allocation of research context by countries. India has the highest number of case studies on SMEs that implement SCM strategy in their organization.

Journal Name	No. of Papers	%
Journal of Manufacturing Technology Management	4	7%
Supply Chain Management: An International Journal	4	7%
Applied Mechanics and Materials	2	4%
IIMB Management Review	2	4%
International Journal of Production Economics	2	4%
Journal of Cleaner Production	2	4%
Journal of Modelling in Management	2	4%
Resources, Conservation & Recycling	2	4%
Social and Behavioral Sciences	2	4%
Sustainability	2	4%
Others	30	56%
Grand Total	**54**	**100%**

Table 2: Distribution of Reviewed Articles by Journal

Figure following on the next page

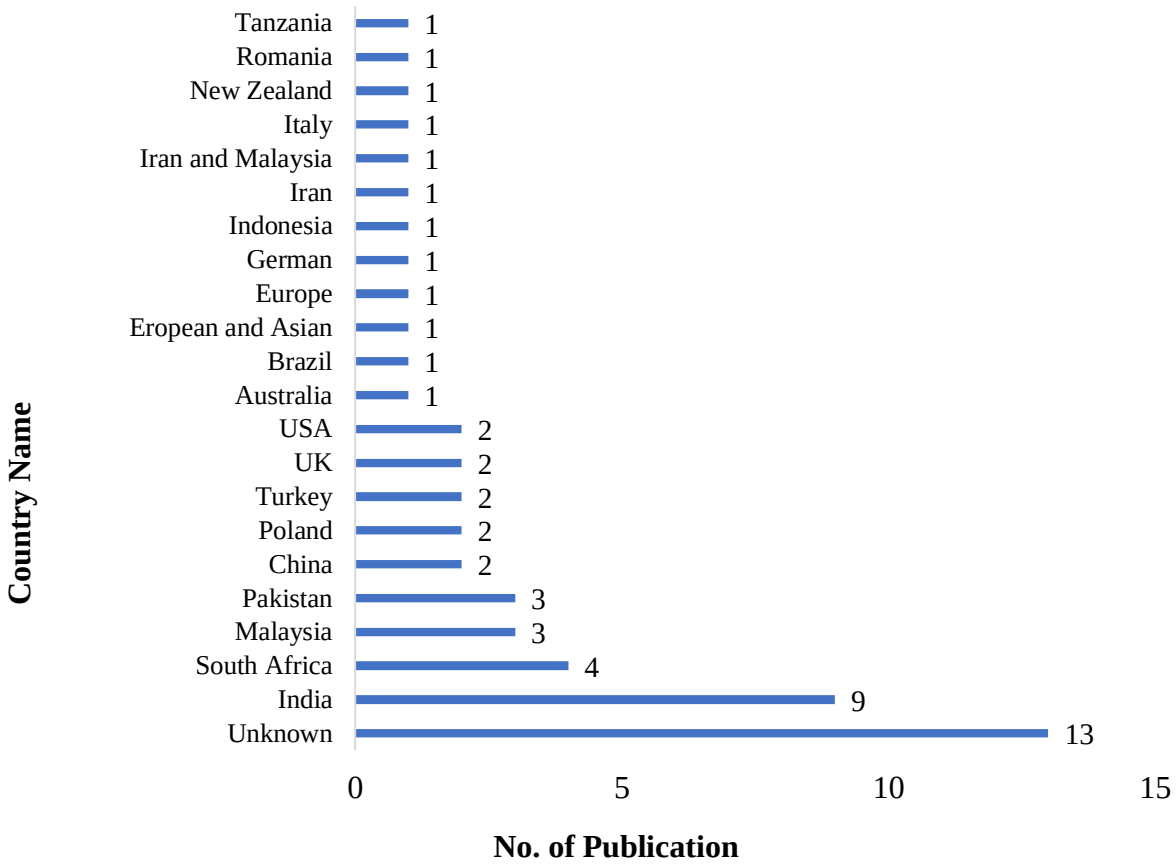

Figure 3: Distribution of Review Articles by Country

3. RESULT AND DISCUSSION

We divide the finding into 2 big areas. The first area is drivers of SCM implementation that include 31 articles, representing 57% of the total articles reviewed. The other area, barriers of SCM implementation include 23 articles representing 43% of total articles reviewed. As shown in Figure 2, the drives and barriers of SCM implementation are becoming a popular research area, currently not only being investigated in the manufacturing field but also in the SME field. SCM can be successfully implemented by classifying and evaluating the drivers and barriers according to the organization's condition (Parmar and Shah, 2016). SCM's partners' pressure, the direct benefit of the use of its system to the process business, and top management commitment are the drivers that have the highest mention in several articles. It is explaining that top management can influence much the organization move towards their goal (Parmar and Shah, 2016). On the other hand, a direct benefit that can get by an organization to their process business are more effective and efficient related to several phases such as production, inventory process, delivery product or service, etc. (Hsu, 2005). Table 3 below mentioned all driver factors that influence the SCM implementation.

Table following on the next page

Factor	Sub Factor	Literatures
Market Pressure	Improve competitive advantage	Saeed and Kersten (2019); Hanif and Usman (2018); Tripathy, et al. (2016); Meehan and Muir (2008)
	Competitor's pressure	Saeed and Kersten (2019); Meyer and Torres (2019); Fawcett, et al. (2008); Akhtar (2019); Gandhi, et al. (2015); Micheli, et al. (2020); Namagembe, et al. (2016); Bagchi, et al. (2005)
	Shareholder/Investor Pressure	Saeed and Kersten (2019); Thakkar, et al. (2008); Micheli, et al. (2020)
	Institutional pressure	Saeed and Kersten (2019); Diabat, et al. (2014); Akhtar (2019); Gandhi, et al. (2015)
	SCM partners' pressure	Saeed and Kersten (2019); Sillanpaa, et al. (2013); Leyh and Thomschke (2015); Jabbour, et al. (2011); Shabbir and Kassim (2019); Fawcett, et al. (2008); Huang, et al. (2015); Tripathy, et al. (2016); Susanty, et al. (2018)
	Reputation/image of corporate	Saeed and Kersten (2019); Sajjad, et al. (2019)
	Globalization	Saeed and Kersten (2019); Fawcett, et al. (2008); Huang, et al. (2015); Diabat, et al. (2014); Chand, et al. (2018); Jain and Benyoucef (2008); Kot (2018); Kherbach and Mocan (2016)
	Improve customer satisfaction	Power (2008); Narimissa, et al. (2019); Sajjad, et al. (2019)
Societal Pressure	Value-based networks	Saeed and Kersten (2019); Koh, et al. (2007)
	Consumer organization	Saeed and Kersten (2019); Huang, et al. (2015); Diabat, et al. (2014); Akhtar (2019); Micheli, et al. (2020); Susanty, et al. (2018)
	The direct benefit of the use of its system to the process business	Power (2008); Chin, et al. (2012); Tummala, et al. (2006); Sillanpaa, et al. (2016); Narimissa, et al. (2019); Jabbour, et al. (2011); Shabbir and Kassim (2019); Sajjad, et al. (2019); Chan, et al. (2012)
Organizational Culture	Innovativeness	Saeed and Kersten (2019), Chin, et al. (2012), Sillanpaa, et al. (2013); Quayle (2003); Sillanpaa, et al. (2013); Kherbach and Mocan (2016)
	Information dissemination	Saeed and Kersten (2019); Hanif and Usman (2018); Power (2008); Tummala, et al. (2006); Sillanpaa, et al. (2016); Leyh and Thomschke (2015); Jabbour, et al. (2011); Shabbir and Kassim (2019); Fawcett, et al. (2008); Talib and Hamid (2014); Chan, et al. (2012)
Factor	**Sub Factor**	**Literatures**
Organizational Characteristic	Position in supply chain	Saeed and Kersten (2019)
	Industrial sector	Saeed and Kersten (2019)
	Size	Saeed and Kersten (2019); Micheli, et al. (2020)
	Geographical location	Saeed and Kersten (2019)
	Degree of internationalization	Saeed and Kersten (2019); Chand, et al. (2018)
Corporate Strategy	Top management commitment	Saeed and Kersten (2019); Hanif and Usman (2018); Sillanpaa, et al. (2013); Leyh and Thomschke (2015); Narimissa, et al. (2019); Sajjad, et al. (2019); Talib and Hamid (2014); Gandi, et al. (2015); Susanty, et al. (2018)
	Cost related pressure	Saeed and Kersten (2019); Sillanpaa, et al. (2013); Susanty, et al. (2018)
	Operational/economic performance	Saeed and Kersten (2019); Tummala, et al. (2006); Narimissa, et al. (2019); Sajjad, et al. (2019); Talib and Hamid (2014); Gandhi, et al. (2015)
	Monitoring, evaluation, and development of implementation	Sillanpaa, et al. (2013); Narimissa, et al. (2019); Varma, et al. (2016)

Table 3: Critical Drivers of SCM Implementation

The financial barrier, resistance to change from the employee, lack of awareness from management, and support from top management are the most significant barriers. However, all of those factors are also important because it will affect the relationship between one and another organization in supply chain collaboration. Table 4 below contains all the barrier factors that influence the SCM implementation.

Factor	Sub Factor	Literatures
Organization	Absence of training classes/ consultancy/ supervise progress	Govindan, et al. (2013); Ozen, et al. (2020); Parmar and Shah (2016); Zaabi, et al. (2013); Majumdar and Sinha (2018); Mafini (2016); Manzouri, et al. (2014); Gorane and Kant (2014); Kumar, et al. (2015); Mafini and Omoruyi (2013)
	Inadequate supplier commitment/ reluctant to share information	Govindan, et al. (2013); Ozen, et al. (2020); Mafini (2016); Kot (2018)
	Inadequate of Inter-departmental coordination in communication	Govindan, et al. (2013); Gupta et al. (2020)

Factor	Sub Factor	Literatures
Organization	Inadequate of involvement of top management in adopting SCM	Govindan, et al. (2013); Majumdar and Sinha (2018); Ozen, et al. (2020); Parmar and Shah (2016); Zaabi, et al. (2013); Gupta, et al. (2020); Manzouri et al. (2014); Salami, et al. (2015); Gorane and Kant (2014); Jayant and Azhar (2014); Rahman, et al. (2011); Kumar, et al. (2015)
	Lack of management capacity	Govindan, et al. (2013); Parmar and Shah (2016)
	Big effort to change organizational strategy	Majumdar and Sinha (2018); Mafini (2016), Manzouri, et al. (2014); Salami, et al. (2015); Gorane and Kant (2014); Masete and Mafini (2018)
	Unclear organization objective	Parmar and Shah (2016); Zaabi, et al. (2013); Majumdar and Sinha (2018); Dubihlela and Omoruyi (2014); Gorane and Kant (2014)
	Inadequate performance measure	Manzouri, et al. (2014); Masete and Mafini (2018)
Financial	Financial constraints	Govindan, et al. (2013); Majumdar and Sinha (2018); Parmar and Shah (2016); Sajjad, et al. (2019); Gorane and Kant (2014); Jayant and Azhar (2014); Mafini and Omoruyi (2013); Katunzi and Zheng (2011)
	High investments and less ROI (Return on Investments)	Govindan, et al. (2013); Ozen, et al. (2020); Majumdar and Sinha (2018); Gupta, et al. (2020); Mafini and Omoruyi (2013)
	Superior execution and preservation cost	Govindan, et al. (2013); Majumdar and Sinha (2018)
Knowledge	Inadequate of SCM system exposure to experts	Govindan, et al. (2013); Gupta et al. (2020); Jayant and Azhar (2014); Rahman, et al. (2011); Ahweda, et al. (2016); Masete and Mafini (2018); Katunzi and Zheng (2011)
	Lack of awareness and participation on SCM	Govindan, et al. (2013); Majumdar and Sinha (2018); Ozen, et al. (2020); Parmar and Shah (2016); Majumdar and Sinha (2018); Salami, et al. (2015); Sajjad, et al. (2019); Farooque, et al. (2019)

Factor	Sub Factor	Literatures
Knowledge	Lack of motivation and employee involvement	Parmar and Shah (2016); Majumdar and Sinha (2018); Mafini (2016); Sajjad, et al. (2016); Gorane and Kant (2014); Rahman, et al. (2011)
Technology	Lack of new technology, materials and processes	Govindan, et al. (2013); Majumdar and Sinha (2018); Ozen, et al. (2020); Parmar and Shah (2016); Zaabi, et al. (2013); Majumda and Sinha (2018); Gupta, et al. (2020); Dubihlela and Omoruyi (2014); Gorane and Kant (2014); Quayle (2003); Chand, et al. (2018); Jayant and Azhar (2014); Katunzi and Zheng (2011)
	Recent exercise inadequate of the flexibility to change into new system	Govindan, et al. (2013); Jayant and Azhar (2014)
	Lack of human resources	Govindan, et al. (2013); Majumdar and Sinha (2018); Ozen, et al. (2020); Rahman, et al. (2011)
	Fear of failure	Govindan, et al. (2013); Majumdar and Sinha (2018); Sajjad, et al. (2019); Jayant and Azhar (2014)
Outsourcing	Lack of standard SCM system to collaborate with suppliers	Ozen, et al. (2020); Parmar and Shah (2016); Manzouri, et al. (2014); Salami, et al. (2015); Switala (2016)
	Lack of Customer Satisfaction Index	Parmar and Shah (2016); Mafini (2016); Gupta, et al. (2020); Garuna and Kant (2014); Ahweda, et al. (2016)
	Lack of Trust among SCM partners	Majumdar and Sinha (2018); Mafini (2016); Gupta, et al. (2020); Manzouri, et al. (2014); Sajjad, et al. (2019); Gorane and Kant (2014); Rahman, et al. (2011)
	Unwilling to share risk and rewards between SCM partners	Govindan, et al. (2013); Ozen, et al. (2020), Manzouri, et al. (2014); Sajjad, et al. (2019)

Table 4: Critical Barriers of SCM Implementation

4. CONCLUSION AND FUTURE RESEARCH

Implementing SCM strategy provides improvement in competitive advantage of organizations as it has been proven by large companies and it can be also a great opportunity for SMEs.

Consequently, the implementation of SCM in SMEs has received growing research interest. Larger companies have more resources in terms of people, finances, and other factors. However, several barriers can be found for the SMEs related to SCM strategy implementation. On the other hand, globalization amplifies drivers for SMEs to improve their supply chain performance. This research provided a structured review of the literature to gain in-depth understanding as well as a compilation of current driver and barrier factors of SCM implementation. From the literature review we could identify 5 key factors and 22 sub-groups both for the drivers and for the barriers of SCM implementation. Major problems are related to the organization structure, financial dimension, pressure from an internal or external organization, technology development, and outsourcing capability. Limitations of this research include that we only considered articles being published in English and used only two sources to gather the articles (ProQuest and Science Direct) which might limit the support of our conclusions. This paper is part of a broader research scope to understand the effect of different SCM structures on the implementation of SCM strategy. Selecting two different countries that have different geographical and SCM structure, can be an approach investigating this effect. Using the results of this paper, we can explore the different opinions towards driver and barrier factors of SCM implementation. Further research can be built by measuring the main drivers and barriers of SCM strategy implementation for SMEs. On the other hand, multiple case studies in different countries and industry areas can also be valuable resources to enhance the conclusions.

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UNETHICAL BEHAVIOR IN ORGANIZATIONS – AN AGENT-BASED APPROACH

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ABSTRACT
This paper introduces an agent-based modelling approach to understanding unethical behavior in organizations. Understanding why people behave unethically is a widely researched topic in the field of business ethics, but researchers tend to use a static approach to this question, resulting in findings with rather limited applicability. This paper builds on the theoretical foundations of complex systems and the method of computational modelling in presenting the process of building an agent-based model that simulates the spread of unethical behavior. The initial observations of this model are discussed along with its limitations and its potential for future improvement.
Keywords: *unethical behavior, complex adaptive system, agent-based modelling*

1. INTRODUCTION

Understanding the causes and consequences of unethical behavior in organizations is a highly relevant topic in our contemporary business environment. Large companies invest heavily in building up their compliance departments and combating the harmful consequences of unethical behavior, still always new scandals emerge that shock people and often ruin corporations. We can think of the example of Enron, but also more recently Volkswagen or Boeing. It has been a challenge from academic perspective to produce valuable knowledge that can help businesses face this issue. Scholarly work in that looks at unethical behavior in business mostly follows the standards of cognitive and behavioral psychology, trying to uncover correlational and causal relationships between individual and contextual factors and mental processes that lead individuals to engage in unethical behavior (Treviño, 1986). However, the models produced by this type of research are necessarily static, and always look at one level of reality at a time (individual or organizational). In this paper I suggest a relatively underutilized approach for studying unethical behavior: computational modelling, and more specifically agent-based modelling. Using an approach in business ethics which is built on a complex systems approach is not without example, but it is certainly rare. Brass et al. (1998), for example, connected network theory with organizational and personal characteristics to propose hypotheses on what influences the spread of unethical behavior in organizations. Zuber, (2015) also proposed a framework which provides a basis for the development of a formal stochastic actor-oriented model of network dynamics which can be used to simulate the spread of unethical behavior. Ashforth & Anand (2003), as well as den Nieuwenboer and Kaptein, (2008) look at the dynamics of the growth of organizational corruption. Building on these previous works, in this paper, I describe an attempt at creating an agent-based model which can simulate the spread of unethical behavior and can help in understanding the role of certain organizational and personal factors. It is important to highlight that here I only aim to lay down the foundations of this possible research project. Therefore this paper has the following goals: (i) summarize the basic understanding of computational modelling and how this is used in social and organizational studies; (ii) find which parts of the existing literature in business ethics can be used to build a computational model; and (iii) build an initial model that can be revised in further iterations. The next section starts with an introduction to computational models of social life and continues with the discussion of how this method can be applied in organizational research.

2. THEORY OF COMPUTATIONAL MODELLING IN SOCIAL SCIENCES

2.1. Complex adaptive systems

As Miller and Page (2009) describe, Adam Smith's analysis of the driving forces of the economy was one of the earliest descriptions of complex systems where the outcomes of the system are the result of the action of independent agents. As social sciences developed, the emphasis shifted from theorizing to tool-building, which led to 'smart but not wise' science. Models built in this tradition are often static and have unrealistic premises, such as very few or infinitely many agents who are not very diverse either. With the help of complex systems science, we can look at 'in between' states and stages that are much closer to real life. Miller and Page also highlight, that although many traditional mathematical models can provide a good understanding of phenomena that are complicated, they usually break down when being used for complex systems with emergent features. The difference between complicated and complex can best be captured this way: in a complicated system, there may be various different elements, and they tend to be independent from each other. Removing one element will not change the system's behavior fundamentally. In a complex system however, the dependence between the elements is of utmost importance. In a complex system removing an element changes the dynamics of the system in a way that is not deducible from the properties of the element that has been removed. Therefore, a complicated system can be reduced to its atomic parts, those parts can be studied separately, and the finding can be summed up in order to answer questions about the system, but this is theoretically impossible in case of complex systems. Social agents form complex systems through their connections that may continually undergo adaptive changes. They make choices with the help of their cognitive abilities, but as these are limited they often rely on simplifications and heuristics (Simon, 1997). With computational modelling that incorporates the basic features of complexity, we can investigate issues that are not yet well understood, such as the relationship between agent sophistication and system outcomes, the role of heterogeneity in the robustness of a system, and the role of control on social worlds. In computational modelling, we want to find out how the lower level entities form the higher-level entities, i. e. we are interested in emergence. Emergence at its most basic form suggests that the behavior of a system is in some way different from what one can understand by aggregating the behavior of its parts. Well known and established theorems related to emergence are the Law of Large Numbers and the Central Limit Theorem. These are built on the idea of disorganized complexity, where the variation in the variables averages out, since extremely high values are cancelled out by extremely low values. Theorems built on disorganized complexity are useful in an environment where the parts are not interdependent and variable values are random. However, much of the social world exhibits different patterns, what we can call organized complexity. In such cases, the resulting distributions will not be normal, and feedback, especially of the positive type, plays an important role. In agent-based computational modelling, the aim is to understand bottom-up mechanisms. The models' basic elements are agents, who are endowed with certain features and attributes. The object of investigation is the interaction of these agents, and the systemwide features and attributes that emerge from these interactions. A potential weakness of computational approaches is that axiomatic proofs may be claimed as superior, as they deductively guarantee their outcome, while computational experiments provide only inductive proof in most cases. However, the deductive elegance often has the cost of the reduction of the problem and its elements to a level where they do not sufficiently resemble reality anymore. Perhaps the best overall approach is to find where computational models can have added value, and where we should stick to more traditional modelling techniques. Old tools and new ones are not substitutes but complements to each other.

2.2. Agent-based modelling in organizational research

Gómez-Cruz, Loaiza Saa and Ortega Hurtado, (2017) provide a comprehensive overview of the use of agent-based approaches used in the organizational studies literature. As they point out, organizations inherently contain complexity and uncertainty. However, the use of computational modelling is still not as widely adopted as in other disciplines, especially in natural sciences. They also distinguish three concepts that are interrelated but cover different meanings. Agent-based complex systems refer to the systems in the real world, that can be understood as the result of the interaction of its parts (agents). They display some common features, such as sensitivity to initial conditions and path-dependence. Agent-based models are abstractions of the agent-based complex systems, and they include three key components: (i) the agents that form the system; (ii) an environment; and (iii) the interaction between the agents and the environment. An agent is defined as "an autonomous computational entity that has its own behavior and attributes" (Gómez-Cruz et al., 2017, p. 314). In the case of modelling organizations, agents can represent social actors, such as employees, customers or suppliers, but they can also represent entities on a lower level such as 'strategies' (as in game theory) or entities on a higher level, such as clusters or countries. The environment always has a predefined topology that can be a network, a Euclidian space, or a geospatial landscape. Agent-based simulations are the computational implementation of agent-based models and they provide the means for gathering data about the system and its dynamics. As the goal of such simulations is to represent interactions and emergent phenomena that are caused by them, they are usually not focused on technical implementation but on conceptual clarity. In addition to understanding complex phenomena, agent-based models and simulations may also be used for aiding decision-making and problem-solving, thus they can become useful tools in management theory and practice. Agent-based approaches are specifically suitable for studying organizational behavior, because the most interesting problems are non-linear, and simple causal relationships are overwritten with complex dynamics. Organizations are systems that have autonomous and heterogeneous agents who do not possess global knowledge of the system. They act locally, in parallel, and distributed ways, that result in discontinuous, non-linear, and asynchronous interactions. The spatial and temporal components are also important, as they provide the opportunity for learning and adaptation. A specific example of using agent-based modelling in an organizational setting is the analysis of flock leadership by Will (2016). Leadership and management in general are often associated with command and control, however it is pointed out by Will that effective leadership is rather about being able to understand interactive dynamics of the organization. Some groundwork on the theoretical side has been laid down earlier that uses complexity theory as a basis for leadership research, but there is still a lot of room for answering specific questions building on these fundamentals. Will uses a flocking model implemented in NetLogo, that is a specific type of agent-based model suitable for representing autonomous agents' behavior resulting in emergent collective phenomena. In such a model, the agents have specific interaction rules that take into consideration the behavior of other agents in the model. There are three basic types of behavioral rules in Will's model: separation, alignment and coherence. Behavioral rules are translated into spatial concepts, where turning and moving towards or away from peers represents closeness in working out solutions to problems. Three collective behavioral patterns are found and described in the model: convergent, volatile and non-convergent. Convergent patterns are equated to technical capacity in behavioral terms, since they represent a tendency of the group to move forward effectively in the same direction to solve challenges posed by the environment. Volatility is translated into adaptive capacity, as this pattern leads to quick transformations that can be understood as new perspectives and cognitive content. Non-convergence is mapped to incapacity, as the group in this case shows net movement close to zero, meaning that there is a lack of capacity for systematic change.

Will uses BehaviorSearch (Stonedahl, 2010), a software that uses a heuristic-based search problem approach to discover the parameter space and generated data in NetLogo. This can lead to identifying rule parameter values that most likely result in specific collective behaviors. For example, it is found that technical capacity is best achieved by a moderately strong separation parameter, very strong alignment and peer exposure parameters and weak coherence and conformity intolerance parameters. Similarly, the parameter setups are discussed for the remaining two collective behavioral patterns.

3. MODELS IN BUSINESS ETHICS

Business ethics is a now established discipline that is centered around studying the questions of morality, as well as ethical and unethical behavior in business. Understanding the causes of unethical behavior in organizations has been an important topic within the business ethics literature since the conception of the field, and despite how dedicated business ethics outlets highlight the importance of conceptual and methodological diversity, there are some dominant trends in how well-accepted research on this topic is done. In this section I discuss these trends through examples and pinpoint some of the limitations they have.

3.1. Methodology in business ethics

Most business ethics research is based on the positivist or post-positivist paradigm. "Positivism is a belief system arising out of practices in the natural sciences which assume that matters that are the subject of research are susceptible of being investigated objectively, and that their veracity can be established with a reasonable degree of certainty."(Brand, 2009, p. 432) Post-positivism, on the other hand, postulates that the world cannot be fully known in its objectivity, but we can get closer and closer to an ideal state of knowledge through setting up hypotheses, and attempting to falsify them. As long as the hypothesis cannot be falsified, it can be accepted as the best possible answer or explanation (Popper, 2002). The practical application of this relies most heavily on verification of hypotheses through statistical significance testing, which is also the most widespread approach in business ethics research. Likert scale surveys and laboratory experiments are the most typical tools used for data gathering. A typical research method can be illustrated through the paper of Brunner & Ostermaier (2019). Based on established concepts in the literature, the authors develop five hypotheses about the relation of honesty in reporting costs for reimbursement and peer influence. They recruited 174 students from a large European university, who participated in a set of experiments. In one setting, there are two reporting managers and one supervisor. Managers have an endowment of 200 units and have a random investment to make with costs between 20 and 100 units, with expected value of 60 units. The expected profit with random variation is 200 units. The supervisors refund the costs but keep the profit that was received from the investment. The expected payoff, in case of honesty is 200 units for both the managers and the supervisors. Report submission is successive, so the reactive behavior of the second manager can be observed. Also, each manager gives an expectation of the report of the other manager. The conditions are separated by how much information the managers have about the other's activity. Under full transparency, managers know each other's reports and actual costs. Under partial transparency, managers know each other's reports, but not their actual costs. The question in each condition is that how big of a 'slack' the managers put on top of their costs in their reports. The participants do ten rounds of the game, and after each round, participants keep their role but are paired up with different participants. The rules are common knowledge to the participants, and they gain actual monetary rewards based on how many units they earned throughout the experiments. Using statistical analysis of the amounts of slack in the different conditions, the authors find support for all their hypothesis and they draw the conclusion that information about peers' behavior has significant impact on the honesty of reporting costs.

Another typical research method is followed by Valle, Kacmar and Zivnuska (2019). This paper investigates the effect of moral disengagement on unethical pro-organizational behavior (UPB). The first hypothesis of the paper is that moral disengagement will positively mediate the relationship between Perception of Organizational Politics (POP) an UPB. The other hypotheses are centered around regulatory focus theory, distinguishing between promotion focus and prevention focus. In their first study 101 university students were asked to evaluate a described internship experience, one group assigned to a high politics perceptions condition, and the other assigned to a low politics perception framed narrative. Survey questions measured the participants' propensity to moral disengage and unethical pro-organizational behaviors. The second study was based on an online survey with two rounds, six weeks apart. The first round measured POP, the second measured moral disengagement, UPB and regulatory focus. Through the statistical analysis of the data gathered from the survey responses, the hypotheses were supported, and the paper concludes that there is statistically significant relationship between POP and unethical behavior that is mediated by moral disengagement. Due to the sensitive nature of the core questions of business ethics, data are hard to get, and it is probably going to get even harder as we move forward. Even when researchers get data, there is always a considerable level of doubt if the data is the true reflection, of what the researchers want to investigate. There are two main issues that can often make findings questionable: the use of proxy variables and the use of proxy subjects. The use of proxy variables means that an ethics related concept cannot be measured directly, therefore the researcher needs to find something that is measurable and is in strong correlation with the specific concept. For example in the case of CEO narcissism, a composite measure that is based on the size of the CEO-s picture in company reports and the relative earnings of the CEO are used as proxies for narcissism (Marquez-Illescas et al., 2019). There is no question about the objective measurability of these data, and their stochastic relation to the concept of narcissism, but it is far from obvious whether they actually capture narcissism as a personality trait. The use of proxy subjects means that researchers use a population that they have access to, most often university students or faculty members, but they draw conclusions in a business context. For example Wang, Zhong, and Murnighan (2014) present interesting findings about the relation of calculative decision making and unethical outcomes that can be highly relevant in the context of business organizations. However, the fact that their research subjects were all undergraduate students may raise some doubts if the same result could be replicated with professionals in different business contexts.
I do not aim to question the rigor or the validity of findings in these works, but I agree with Campbell and Cowton (2015) that in business ethics, an implicit assumption has been formed that only statistical data can be robust and legitimate, while other approaches are often neglected, although mixed methods may provide a better way for answering some of the questions in this domain.

3.2. Concepts in business ethics

Trevino's paper (1986) on ethical decision-making in organizations is one of the foundational and most highly cited works in the behavioral ethics literature. She proposed an interactionist model, in which the cognitive moral development of the individual is the most important element, but other individual and situational factors also play a role in making a decision about an ethical dilemma. This model has inspired a lot of empirical research, which have been reviewed by Treviño et al. (2006). They present an expanded model which considers cognitive processes (moral awareness, moral judgement, moral disengagement, cognitive biases) as well as affective and identity-based factors. Among organizational contextual factors they include language, reward/punishment, ethical infrastructure, ethical climate/culture and leadership in the model. Kish-Gephart et al. (2010) published a meta-analytic study in which they analyzed a large set of available empirical data in relation to the propositions of these models. They found

support for the relation to unethical choices and behavior of cognitive moral development; the moral philosophy of idealism and relativism; Machiavellianism; locus of control; job satisfaction; gender; age; the moral intensity of the issue; egoistic, benevolent and principled ethical climates; the strength of ethical cultures; and the enforcement of code of conducts. However, they did not find support for the relation of education level and the existence of a code of conduct to unethical intention and behavior. On the one hand, this richness of factors that influences unethical behavior in organizations can be informative, on the other hand, it makes it very difficult to model unethical behavior in a dynamic way. Therefore I would like to merge this group of models with that of Zsolnai (2012). He presents a two-factor model in which the moral character of the agents and the relative cost of ethical behavior determine if the agent behaves ethically or unethically. Though his model was not created specifically for studying organizational unethical behavior, its general framework makes it applicable in this setting as well. The first factor in this model can be understood as a combination of all individual factors described above, while the second factor can provide a more systematic understanding of the situational factors through understanding them in the economic terms of relative costs. This enables the building of a dynamic model that is discussed in the next section.

4. BUILDING A MODEL IN NETLOGO

4.1. Building the initial model

In this project, NetLogo (Wilensky, 1999) is used for building the model. As Wilensky and Rand (2015) highlight, NetLogo is the most widely used agent-based modelling environment. It was created by Uri Wilensky in 1999 and has continuously been developed since then. The tool has extensive documentation and another great advantage of it is that it is open source and free to use. Wilensky and Rand (2015) provide guidance on how one can build a model from ground up. They distinguish two types models based on the model's objective: phenomena-based modelling and exploratory modelling. In the former the goal is to reproduce a known pattern on a higher level and investigate the mechanisms on the lower level that can provide explanation for the emergence of the pattern. In the latter, the agents are created with a preset behavior and the modeler observes the patterns that emerge on the system level (perhaps this is also a reason why the person running the model is referred to as the observer in NetLogo terminology). The first type corresponds to a top-down approach, where the research questions are preset and more exact, while the second corresponds to a bottom-up approach, where the research questions might be less clearly formulated, and the conceptual model is continuously evolving as the model is being built up and perfected. The bottom-up approach is closer to the way I attempt to use NetLogo in this project. The authors also call attention to the 'ABM design principle' which basically instructs modelers to keep their models as simple as possible and free from redundant elements. The process of modelling in Netlogo includes setting up agents with specific features and rules of behavior. Agents can be one of three types: turtles, patches and links. Turtles represent agents that are 'alive', they can move around and reproduce. Patches can be considered as the building blocks of the environment, and they can also be set up with rules. Links are relations among the previous two types of agents. When a model is run, a timer moves forward in discrete time steps that are called 'ticks', and the agents can interact with each other based on the coded rules. The observer can run the model and observe the results of the interactions as ticks progress. The observer can rerun the model as many times as necessary to make multiple observations. The initial model that I have already set up consists of a number of initial turtles, their initial endowment of *score* and *ethicality* and two general variables, one representing the *relative cost of ethical behavior* and another that is named *diversity*. Based on the previously mentioned model of Zsolnai (2013) the two most important parameters in the model are the moral character of the agents (termed *ethicality* in the model) and the *relative cost of ethical behavior*.

At the setup, the observer can choose how many turtles will be generated. When 'born', each turtle receives a value of *ethicality*, and the observer can determine an average level of ethicality. As a result, the turtles' level of *ethicality*, that can take integer values between 0 and 100, is set along a normal distribution where the mean is equal to '*average-ethicality*' and the standard deviation is equal to '*diversity'*, another parameter that can also be set by the observer. Figure 1 shows the sliders that enable the tuning of the parameters on the left side, and the graphical display of the 'model world' on the right.

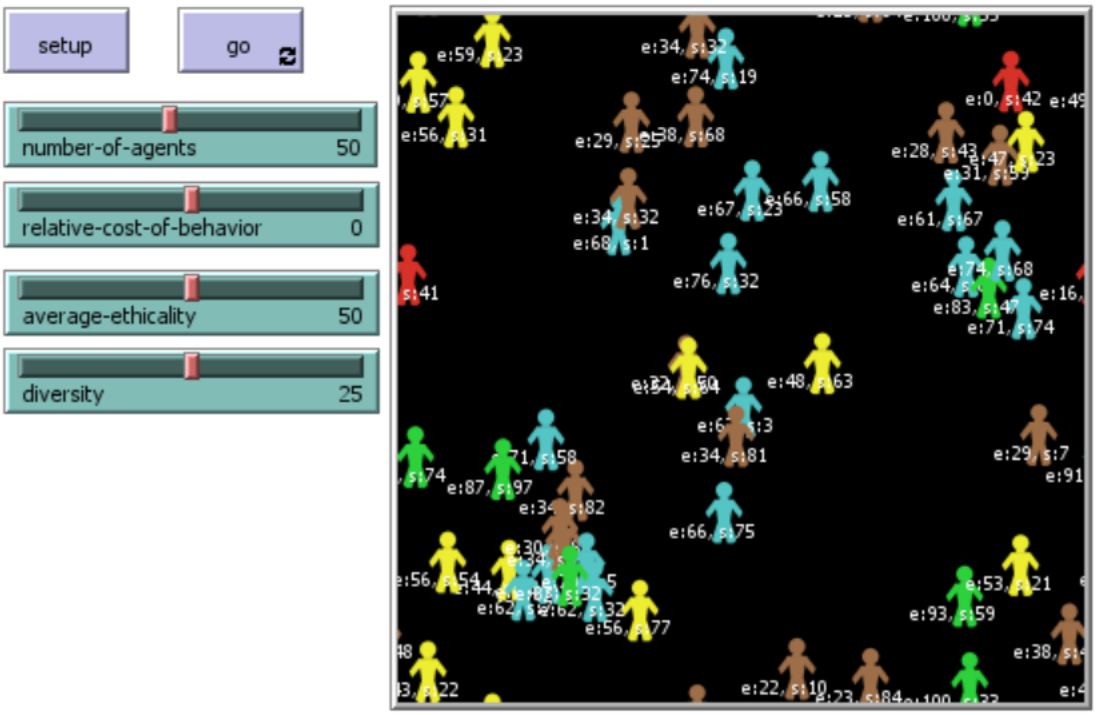

Figure 5: Initial setup of parameters and turtles

In addition to the *ethicality* (shown as e: n on the label of the turtle), each agent receives a '*score'* that is determined as a random number between 0 and 100 at their conception (shown as s: n on the labels). *Score* will determine the fitness and reproducibility of an agent. The world is a two-dimensional square shaped space with 20 units of side length. The world also 'wraps', which means that if a turtle exists on the right side, it will reenter on the left side as if these locations were adjacent. In each tick, the turtles move forward one unit in the world in random direction. When two turtles come to occupy the same location in the world, they interact. For now, the interactions are limited to exactly two turtles, and if a turtle arrives to a location where two turtles are already located, it moves further forward one unit. In an interaction, each turtle has two possible behaviors: act ethically or act unethically. The choice of the behavior is determined the following way. A random number between 0 and 100 is generated. This random number is saved into a variable for this interaction that is called '*chance*'. If the *ethicality* of the turtle making the choice is greater than or equal to *chance*, then the turtle will act ethically. If *ethicality* is smaller than *chance*, then the turtle will act unethically. This way turtles with high *ethicality* will generally act more ethically, while turtles with low *ethicality* will act unethically most of the time. If a turtle acts ethically, the turtle with whom it interacts receives plus one *score*. In case of unethical behavior, one *score* will be deducted from the interacting turtle. As a result, ethical actors advance the *score* of other turtles while unethical actors decrease it. Additionally, acting ethically has a relative cost that is set the following way: an ethical action will cost a turtle a deduction of one *score* multiplied by the parameter '*relative-*

cost-of-behavior'. This parameter can be set between -10 and 10, thus the cost can also be negative, which results in a gain in *score* when the turtle acts ethically. If this parameter is set to a positive value, then the agents who act ethically will tend to lose *score*. If the parameter is set to zero, the agent will not lose or gain *score* by acting ethically. The coded version of this is shown on Figure 2.

```
to interact
set chance random 100
ask turtles-here[
    if ethicality >= chance [
      act-ethically
      set myscore myscore - 1 * relative-cost-of-behavior
    ]
    if ethicality < chance [
      act-unethically
    ]
    set label (word "e:" ethicality ", " "s:" myscore)
  ]
end

to act-ethically
  set ethical-action-count ethical-action-count + 1
  ask other turtles-here[
    set myscore myscore + 1
  ]
end

to act-unethically
  set unethical-action-count unethical-action-count + 1
   ask other turtles-here[
    set myscore myscore - 1
  ]
end
```

Figure 6: Code of interactions

Finally, in every tick, agents are instructed to 'die' or 'reproduce' and this is determined by their *score*. The three turtles with the lowest *score* cease to exist, while the three turtles with the highest *score* will produce copies of themselves and in the process, they lose half their *score*. The turtles that are 'born' receive a random *score* between 0 and 100 and *ethicality* that is inherited from their 'parent' plus a term that is a random number from a normal distribution with a mean of zero and standard deviation of the *diversity* parameter divided by four. This way *diversity* plays a role in not only the initial setup, but also how likely the reproduction is to produce turtles with different *ethicality* from their parents. This mechanism reflects the evolution of ethical and unethical behavior. The code for reproduction is shown on Figure 3.

Figure following on the next page

```
to reproduce
  ask min-n-of 3 turtles [myscore] [die]
  ask max-n-of 3 turtles [myscore] [
    set myscore myscore / 2
    hatch 1 [
      rt random 360
      setxy random-xcor random-ycor
      set myscore random 100
      set ethicality ethicality + round random-normal 0 diversity / 4
      bound-ethicality
      set-colors
    ]
  ]
  ask turtles[
  set label (word "e:" ethicality ", " "s:" myscore)
  ]
end
```

Figure 7: Code of reproduction

4.2. Initial observations

At this point, I am not able to draw true conclusions from the model, but after running the model several times, I have made some initial observations. When running the model, NetLogo provides tools for visualizing how certain variables change. I have set up plots to visualize the average *score* and average level of *ethicality* of turtles, as well as the count of ethical and unethical actions. The model is run for 500 ticks, and based on the setting of the parameters, these plots will yield different results in each run.

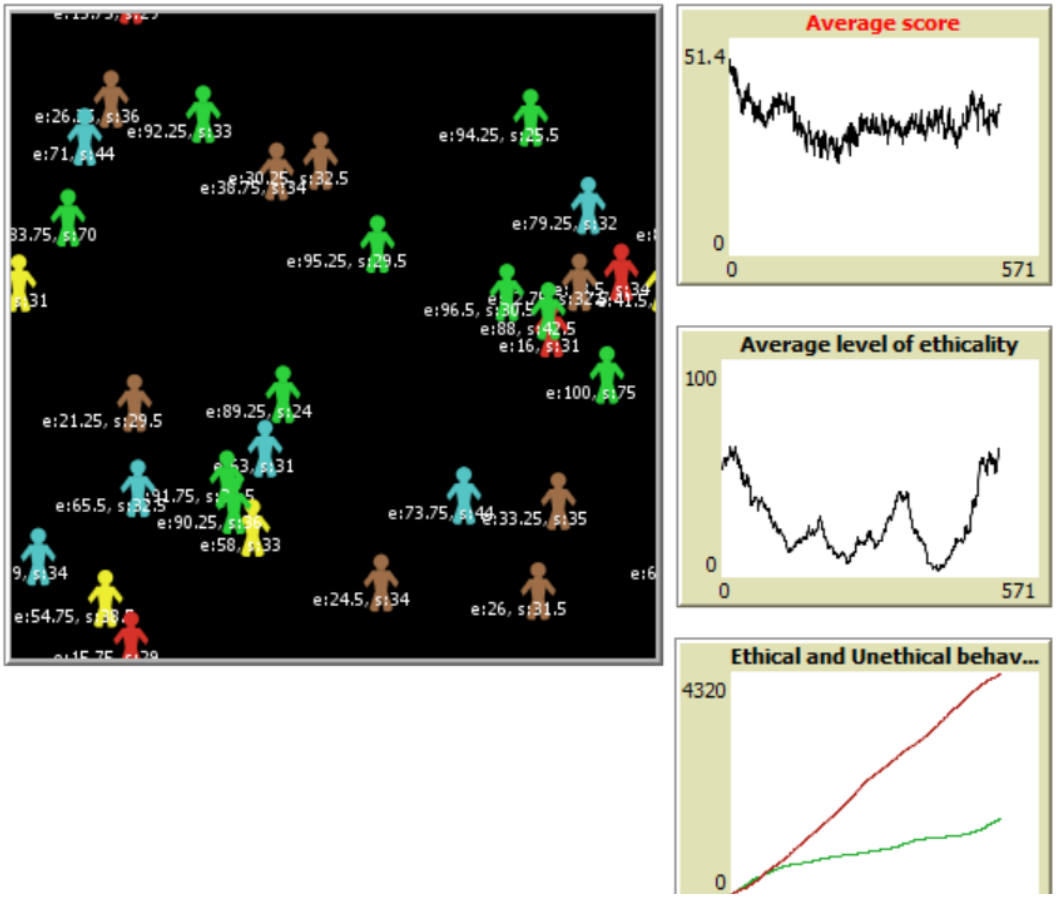

Figure 8: Plots of score, ethicality and behaviors

From the runs I have completed so far, it seems that the setting of the *relative cost of ethical behavior* has the largest impact on the measured variables. Mathematically, this is no surprise, since in the current model design it is the only variable whith a multiplicative effect. However, what seems somewhat surprising is that a small value, on either the positive or the negative side of the spectrum, did not seem to produce very different results in terms of the measured variables compared to a large value on the same side. I.e. when the *relative cost of ethical behavior* was set to 1 and when it was set to 10, the results seemed to be very similar – the level of *ethicality* dropped and tended to remain low, but with all other parameters being the same, the drop was not visibly faster when the parameter was ten times larger. Another observation that was somewhat unexpected was that the initial level of *ethicality* did not matter too much. With positive *relative cost of ethical behavior*, a generally low level of *ethicality* seemed to arise almost as quickly when starting from an average level of *ethicality* near the middle as when starting from near the maximum. The impact of *diversity* was also interesting, since a high level of *diversity* allowed for changes in tendencies of ethicality. For example, when it was driven to a low level by the positive *relative cost of ethical behavior*, it could bounce back and even show considerable upward trends for shorter periods.

4.3. Limitations and future directions

As highlighted earlier, this is just a very initial phase of the modelling project and therefore there are many limitations and possibilities for improvement. In terms of the model setup, the conceptual ideas have to be thoroughly reviewed. The basic building blocks are probably feasible, but the relationships among them might require changes in the model. For example, the *relative cost of ethical behavior* is currently a constant that is not impacted by the other variables, and this might be revised. A feedback mechanism from the average level of *ethicality* could possibly be included, that would influence this parameter during the run of the model. Also, the evolution of *ethicality* is now captured in terms of turtles ceasing to exist and others coming to life. This way, the turtles do not represent persons, rather memes that go through an evolution on their own level, but this might be different from looking at the behavior of persons. As an alternative, a mechanism could be applied in which the turtles do represent persons, and their level of ethicality changes as a result of interactions with other turtles and perhaps other factors as well. Again, a further limitation is the arbitrariness of choices in terms of numbers that are currently in the model. This could be addressed by analyzing mathematically if a different choice of numbers has a serious impact on the outcome and enhancing the model in a way that the arbitrary choice of numbers does not influence the dependent variables. In general, to draw any valid conclusions, rigorous analysis of the results is necessary, which is not provided here. This can be accomplished by using automated reruns of the model and finding patterns of certain combination of parameter values leading to certain sorts of outcomes. Similarly to the paper presented in the theoretical section, BehaviorSearch (Stonedahl, 2010) could be used as a tool for this exercise.

5. CONCLUSION

Complex systems are qualitatively different from complicated systems, and they cannot be well understood with reductionist models. Social systems, such as organizations are inherently complex, as they are comprised of conscious, autonomous agents whose behavior is often not random and is full of interdependencies and feedback mechanisms. Research in business ethics usually relies on methods that aim to capture static relationships between different concepts, and such research can certainly produce interesting and useful findings, but it also has some limitations including its inability to capture dynamic phenomena. In this paper, I have proposed the use of computational modelling to gain understanding of the dynamic nature of unethical behavioral patterns in organizations.

I created and described an initial model using the NetLogo programming environment. I have managed to observe a few interesting patterns with the help of this initial model, but much more work is needed to strengthen the model and apply tools with which more general conclusions can be drawn.

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AN ANALYSIS OF FACTORS DRIVING GENDER DIVERSITY AND INCLUSION IN JAPANESE ORGANIZATIONS

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ABSTRACT
This study presents a literature review of success factors and barriers for gender diversity and inclusion in managerial roles in Japanese organizations. Although the literature about gender diversity in Japan slowly gains momentum, however many studies are based on experiences from the United States and Western Europe. Using a holistic approach, the research addresses the societal, organizational, inter-personal and individual level factors related to workplace gender diversity and inclusion in Japanese organizations and identifies research gaps for a future research agenda.
Keywords: *gender diversity, literature review, women in Japanese organizations*

1. INTRODUCTION

Equality Opportunity Law of 1985 in Japan bans gender discrimination; however, gender discrimination remains (Nemoto, 2013; Benson and Debroux, 2013). Women are still underrepresented in management level, characterized by pay gap in Japanese organizations (Nemoto, 2013). Japanese government and institutions increase the pressure to put more women into leadership (Koura et al, 2017), however the large listed companies in Japan still do not represent diversity (Morikawa, 2016; Saito, 2018). Very few women hold managerial or board positions in Japan today (Nemoto, 2016). In 2017, the percentage of women on the boards of publicly traded companies in Japan was only 3.7% in comparison with the US, where the percentage was 18.7% (Tanaka, 2018). In Japan, gender diversity has traditionally been low because traditional cultural values, which are then embedded in organizational cultures, are male-centered (Sugihara and Katsurada, 2002). Against this backdrop, the global diffusion of the norms of CSR has undoubtedly put pressure on Japanese businesses to employ more women (Brinton and Mun, 2016; Haak, 2006; Mun and Jung, 2018) and closing the gender gap has recently become one of the key strategies to boost labour participation and improve economic growth in Japan (Iwaasa et al, 2017). However, the "glass ceiling" that prevents women from accessing to higher positions in the organizational hierarchy appears to persist (Mun and Jung, 2018). This research seeks to summarize the papers about gender diversity in Japan and build a literature review of the academic literature within Japanese context in order to contribute to organizational studies and understand the factors and reasons of female underrepresentation in Japanese organization. While management research on gender diversity in the Japanese workplace is slowly gaining momentum (Kato and Kodama, 2018; Mun and Jung, 2018; Nakagawa and Schreiber, 2014; Tanaka, 2014), most contributions on antecedents of diversity present macro-level analyses such as parental leave legislation (Asai 2015; Lee and Lee 2014), or focus their attention on specific factors that affect the presence and extent of workplace gender diversity, such as CSR (Kato and Kodama, 2018; Mun and Jung, 2018). In order to understand the factors influencing better female participation in decision making, all the findings from the literature were integrated into several layers: institutional, organizational, team, and individual level and this way helped to organize the existing literature and based on this analysis, literature gaps were identified that may need more empirical evidence.

This "holistic" approach captures all complications related to gender diversity and inclusion in the Japanese organizations. Specifically, the research paper addresses the following the question: What is the interplay among system-wide, organizational, inter-personal and individual level factors? In order to investigate the impact of different layers of factors and to organize them, insights were obtained from different theoretical approaches: Hofstede cultural dimensions (Hofstede, 2009), Neo-institutional Theory (Meyer and Rowan, 1977), the Categorization-Elaboration Model (CEM) of diversity (van Knippenberg et al., 2004), and Intersectionality theory (Holvino, 2010). Finally, the paper has practical relevance as it may help HRM and top managers of the Japanese organizations to pay attention on uncovered areas of management practices and corporate culture in order to increase the diversity and inclusion.

2. LITERATURE REVIEW APPROACH

This paper focused on the studies published in English, in peer-reviewed academic journals and books. Additionally, a few discussion papers were added to our study, since the data published there is considered highly relevant. Workplace gender diversity is a multidisciplinary topic, and there are cross-disciplinary studies in the fields of business, economics, psychological, social and gender studies. The following electronic databases and sources were used for searching: Scopus, Science Direct and EBSCO, using the search words "gender diversity in Japan", "women in Japanese organizations", "inequality in Japan". The search was done in August 2019. By means of this search strategy, more than 100 contributions were identified. A significant part of this literature was related to history of equality in Japan and equal employment opportunities and education, as well as gender roles as being women/mothers in Japan and gender stereotyping and social studies, work-life balance, in addition to studies about women participation in civil and official political institutions of power in Japan. These articles were removed unless they provided evidence of gender diversity in the workplace. The final list of relevant literature related to Japanese context consists of 28 contributions (Table 1).

Table following on the next page

	Papers	Journal	Name	Main themes
1	Abe, (2013)	Japan and the World Economy	Regional variations in labor force behavior of women in Japan	Study about regional differences in women's participation in labor market in Japan
2	Adler, (1987)	Human Resource Management	Pacific Basin Managers: A Gaijin not a woman	Perception of foreign women in management
3	Adler, (1994)	International studies of Management and Organization	Asian women in management	Obstacles women face in Asia in advancing career
4	Alkubati, (2019)	Journal of International Women's Studies	Re-Evaluation Gender Reforms in Non-Western Nations: A case study of women's empowerment in Japan	Evaluation of womenomics, Japanese Prime Minister policy
5	Benson and Yukongdi, (2011)	Asia Pacific Business Review	Asian Women Managers: Participation, Barriers and Future Prospects	Review of barriers, legislation norms for better women participation
6	Bobrowska and Conrad, (2017)	Japanese Studies	Discourses of Female Entrepreneurship in the Japanese Business Press – 25 Years and Little Progress	Positioning of women, entrepreneurs in the Japanese press, stereotyping
7	Fontana (2019)	Culture and Organization	When the main job tasks are perceived to be "irrelevant" in the workplace: the internal uselessness of corporate social responsibility work in Japan.	About frustration of CSR workers and their work as "useless"
8	Hirsch, (2000)	Ethics	Culture, Gender and Work in Japan: A case study of a woman in management	About difficulties a woman manager faces in Japan
9	Iwaasa et al., (2017)	Book, Springer International Pubslishing	A study of the current status of diversity faultlines in Japanese work organizations	Observation of diversity faultlines
10	Kato and Kodama, 2018	British Journal of Industrial Relations	The Effect of Corporate Social Responsibility on Gender Diversity in the Workplace: Econometric Evidence from Japan	Empirical study of effect CSR on gender diversity in Japanese organizations
11	Kato and Kodama (2015)	IZA Discussion Paper No. 9379	Work-Life Balance Practices, Performance-Related Pay, and Gender Equality in the Workplace: Evidence from Japan	Empirical evidence from Japan, impact of HRM practices (work-life balance and performance-related pay) on gender equality in the workplace
12	Kawaguchi, (2015)	Journal of the Japanese and International Economies	Internal labor markets and gender inequality: Evidence from Japanese micro data, 1990-2009	Investigates the association of internal labor market with gender equality
13	Kodama et al.2016	Discussion paper of RIETI and part of the project "Effect of diversity on economic growth and business competitiveness"	Transplanting Corporate Culture across International Borders: FDI and Female Employment in Japan	Foreign institutions and gender diversity in Japan
14	Liddle and Nakajima (2004)	Women's History Review	States of Distinction: gender, Japan and 1the international political economy	Gender, relation of power, internationalization, conceptual framework to understand of the place of women in Japan
15	Macnaughtan, (2015)	The Asia-Pacific Journal	Womenomics for Japan: is the Abe policy for gendered employment viable in an era of precarity?	Womenomics policy, analysis of obstacles
16	Magoshi and Chang (2009)	Journal of World Business	Diversity management and the effects on employees' organizational commitment: Evidence from Japan and Korea	Empirical evidence of diversity management practices in Japan
17	Morikawa, (2016)	Japan and the World Economy	What types of companies have female directors? Evidence from Japan	About ownership of the companies which have female directors
18	Mun and Jung, (2018)	Administrative Science Quarterly	Change above the Glass Ceiling: Corporate Social Responsibility and Gender Diversity in Japanese Firms	CSR and investor relations and influence on gender diversity
19	Nakagawa and Schreiber, (2014)	Journal of Diversity Management	Women as drivers of Japanese firms' success. The effect of women managers and gender diversity on firm performance	Empirical study to investigate the impact of female managerial participation and corporate performance
20	Nemoto, (2013)	Gender, Work and Organization	Long work hours and the corporate gender divide in Japan	The impact of long working hours to gender inequality
21	Nemoto, (2013)	Work, Employment and Society	When Culture Resists progress: Masculine organizational culture and its impacts on the Vertical segregation of women in Japanese companies	Employment barriers that regular women workers face in Japan
22	Nemoto, (2016)	Book, Cornell University Press	Too Few women at the Top: The Persistence of Inequality in Japan	Observation of 5 Japanese companies, empirical study to review the issues of gender inequality in Japan
23	Nemoto,(2008)	Gender and Society	Postponed Marriage: Exploring Women's Views of Matrimony and Work in Japan	How gender inequality shape women's decisions to postpone marriage in japan
24	Ogasawara, (1998)	Book. University of California press	Office Ladies and Salaried Men: Power, Gender and Work in Japanese companies.	About work and gender segregation in Japanese organizations
25	Ono, (2007)	American Sociological Review	Careers in foreign-owned firms in Japan	Review of foreign companies and career there in Japan
26	Sugihara and Katsurada, (2002)	Sex roles	Gender role development in Japanese culture: diminishing gender role difference in a contemporary society	Gender and roles segregation in the Japanese society
27	Tanaka, (2018)	Journal of the Japanese and International Economies	Gender diversity on Japanese corporate boards	Analysis of female directors on Japanese corporate boards
28	Usui et al., (2003)	Asian Perspective	Women, Institutions and Leadership in Japan	Overview of female representation in leadership positions in Japan

Table 1: List of literature

3. LAYERS OF FACTORS

This section provides an overview of different layers of factors impacting on gender diversity. The focus is on factors impacting gender inclusion in business decisions and, and whenever previous research exists, on their relevance in the Japanese business context. Following an early approach to gender and power in organizations (Ragins and Sundstrom, 1989), four levels of analysis were identified: social systems, organizational, interpersonal and team level and individual. The social system level focuses on society and cultural values that are gender-related. The organizational level captures policies and practices within firms that may be used to promote gender equality, such as CSR and HRM. The interpersonal or team-level focuses on relationships with leaders and peers. The individual level focuses upon the personal resources of an individual, which may include personality, motivation and aspiration levels. To this four-tier classification, we add the institutional level, capturing pressures on companies emanating from political and economic stakeholders (Figure 1). Concepts from several different theoretical approaches help inform the analysis of the different levels of factors, thereby offering opportunities to integrate them in the analysis of gender inclusion in the workplace.

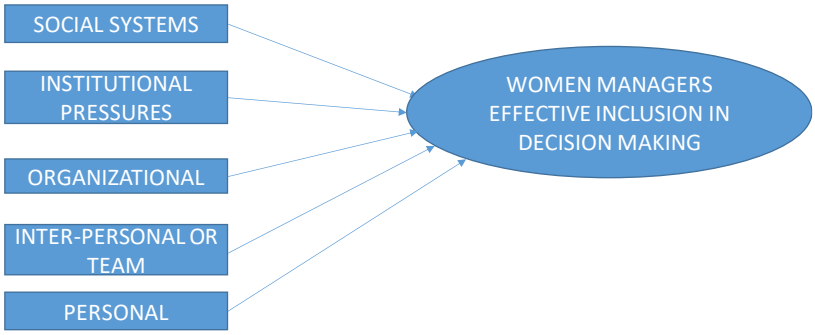

Figure 1: Layers of factors relevant for women managers' inclusion

3.1. Social Systems and Institutional Pressures

This section introduces cultural and institutional influences on gender diversity and inclusion and presents contributions concerning Japan, this part is widely observed in the academic literature in the Japanese context. Culture, intended as the norms and beliefs which are shared by people (Hofstede, 2001), clearly has a significant role in workplace gender diversity, because culture influences social categorization based on gender (Cox, 1994). Gender stereotypes are culturally shared beliefs (Eagly and Karau, 2002; Hirsch, 2000) and gender roles are culturally constructed (Moore, 2015). Socio-cultural context influences on formation of the work and family related values and norms (Aygan, 2004). Adler (1994) explained the underrepresentation of Asian women in management by cultural and religious traditions. Japanese culture has traditionally triggered gender bias and segregation in the workplace (Sugihara and Katsurada, 2002), as well as more participation of females in the public and males in the domestic roles was not supported in the past (Tamanoi, 1990). Religions in Japan (Confucianism, Buddhism and Shintoism) encompass female un-friendly values, which support male-dominating thinking, and gender discrimination (Liddle and Nakajima, 2004). Confucianism strongly influenced Japanese culture (Adler, 1994, 1987; Sugihara and Katsurada, 2002) and the Japanese view women not as decision-makers, even more egalitarian in nature, originally a matriarchal society, Japan turned to patriarchal system (Sugihara and Katsurada, 2000; 2002). Two dimensions of national culture: power distance and masculinity affect social gender roles (Hofstede, 2001; Szymanowicz and Furnham, 2013; Lewellyn and Muller-Kahle, 2019). Cultural expectations still put pressure on Japanese women to be solely responsible and caring for the family (Smirles et al., 2020; Aono and Kashiwagi, 2011). Japanese society still practices a gendered division of labor, where woman`s place is at home (Sugihara and Katsurada, 2000).

According to the Hofstede dimensions, Japan is a hierarchical society, putting higher value in group interests than in individualistic ones. Power distance is "the extent to which the less powerful members of institutions and organizations within a country expect and accept that power is distributed unequally", (Hofstede, 2001, p. 98). Japan's power distance has an intermediate score of 54, it is not so hierarchical as other Asian countries, however all the decisions must be confirmed by each hierarchical level. Japan has one of the highest indexes of uncertainty avoidance with score 92, and a score of 95 in masculinity as a consequence of the fact that gender roles in the society are rigid and assign greater importance to masculine values (Hofstede, 2003). As noted by Hofstede (2001, p.297) "social gender roles are clearly distinct" in countries with high scores of masculinity. Male characteristics like achievement and status are emphasized and encouraged as a source of pride. And women shall be focused on roles, involving personal relationships (Hofstede, 2001). Hall (1966) distinguishes high and low context cultures and classifies Japan as a "high context" culture, where formal, indirect and implicit communication convey the messages: sensitive topics and direct expressions of opinion tend to be avoided in order to reach the intergroup harmony and shun conflicts. Trompenaars and Hampden-Turner (1997) classified Japan as having an upper-middle level degree of "universalism", whereby formal rules are much more important than human relationships. In the same direction, the GLOBE project (House et al., 2004), which extends the Hofstede model (Ralston et al., 2018; Schneid et al., 2015) shows the Japanese culture as being relatively low gender-egalitarian (GLOBE project, 2019). By representing formal and informal constraints (North, 1990), institutions influence organizational structure and business behavior (Iannotta et al., 2015; Meyer, 2010; North, 1990; DiMaggio and Powell, 1983). Iannotta et al. (2015) suggested that cultural institutions, multiple institutional domains, regulatory policies, welfare provision, labor markets are interrelated and can positively influence gender diversity on corporate boards. Various institutional barriers remain preventing the equal women participation in the labor market (Ono, 2007). The discussion on gender quotas in corporate boards is often associated with the concept of "Tokenism" (Kanter, 1977). When boards include few women, they are considered as tokens (Torchia et al., 2011), leading to conjecture that tokenism characterises Japanese boards. Tokenism explains the importance of organizational structure and context in the underrepresentation of women in decision-making positions (King et al., 2010). Token women experience high level of visibility, since the token are in scarce present, which creates a social isolation and feel the pressure to be in line with social role and gender stereotypes (Kanter, 1977a; King et al., 2010). A woman is considered to be a token, if females are less than 15% in the given context according to tokenism theory. In the last twenty years, there has been a pressure from international institutions and from foreign investors to align Japanese companies' corporate governance with international standards and introduce gender diversity in boards (Saito, 2018). In foreign companies the Japanese women have more career opportunities than in Japanese firms, historically foreign companies utilized more female talents in Japan according to White Paper of Gender Equality published by Cabinet office in Japan as their host countries are more advanced in term of gender equality. The effects of gender diversity on Japanese organizations have proved to be beneficial. Siegel and Kodama (2011) and Niikura and Seko (2017) show that organizations with more female directors have a positive effect on ROA. Additionally, a recent empirical study by Tanaka (2018) shows that publicly traded Japanese firms with more women directors exhibit higher performance. Notwithstanding increasing pressure, Morikawa (2016) reported that the boards of the large listed companies do not necessarily exhibit greater diversity. This state of things aligns with Oliver's (1991) contribution on organisations' strategic responses to institutional pressures, which highlights that diversity policies represent a "contested institutional terrain". In effect, failure to fully embrace policies that are considered standard in different national settings reflects more broadly "Institutional distance", i.e. a difference between two 'countries' institutional profile' (CIP)

based on the regulatory, normative and cognitive institutions of a country (Ferner et al., 2005; Kostova, 1999; Scott, 1995). Cultural stereotypes affect Japanese women's career aspirations, work-life goals and confidence in own leadership potential (Yamamoto and Ran, 2014; Smirles et al., 2020; Aono and Kashiwagi, 2011). Recent researchers show that Japanese culture has become more supportive of egalitarian view of gender roles and women in the workplace due to recent demographic and economic change (Yamamoto and Ran, 2014; Hashimoto, 2017; Piotrowski et al., 2019; Smirles et al, 2020).

3.2. Organizational level

Several studies have underscored the role of corporate culture and climate in influencing gender diversity (McDonald, 2003). Additionally, King et al., (2010) considered about psychological climate of gender inequity as a critical and broader indicator of women's interpretation of the work and social contexts and gender inequity, focused on individual perceptions of policies and practices in the organizations which were interpreted as unfair. The importance of creating an organizational climate for diversity (Guillaume et al., 2013) has been identified as an effective way to make "diversity at work to work" (McKay et al., 2008). Cox (1993) argues that climate plays an important role as moderator in the impact of diversity on team performance. van Knippenberg et al. (2013) suggest that a diversity mindset in organizations moderates the relation between diversity and performance, and proposes three aspects of this mindset: accuracy, sharedness and awareness of diversity cognition. Mor Barak (1998) conceptualized a diversity-prone environment using two dimensions: individual views and prejudices towards people who are different from themselves and organizational policies and procedures concerning minorities and women. Analogous dimensions were suggested by Cox (1994) individual-level and organizational level factors to assess the organizational diversity climate. Adler (1993) already mentioned that male-dominant organizational culture is an obstacle to women's career advancement, with difficulty to enter "old boys' network" (Aygan, 2004; Davidson and Cooper, 1992). Macnaughtan (2015) argues that it is hard for women to make career in Japan, since the workplace culture is based upon with the male breadwinner model, prescribing women to work on the same way. Most women work in occupations which are associated with lower power, nurses, elementary school teachers, secretaries, assistants (King et al., 2010; Lips, 2001; Thornborrow and Sheldon, 1995). Fritz and Van Knippenberg (2017) suggest that organizational climate as well as cooperative climate may encourage leadership aspiration therefore it is important to create such an environment and stimulate female leadership aspiration. Moreover, Japanese working environment is characterized by complex value system, high formality and hierarchical system and top-down culture (Demise, 2005; Fontana, 2019). As being hierarchical society in which relationships are defined as subordinate-superior, obedience and loyalty to bosses and companies are naturally driven by influence of Confucian teaching (Sugihara and Katsurada, 2000; Hamada, 1996). Workplace culture in Japan force women to choose between career or family orientation, "emulating masculinity or opting out" (Nemoto, 2013 p.514), stereotyping woman who want to combine the roles, while men career opportunities are not limited by fatherhood (Lyon and Woodward, 2004; Watts, 2009; Nemoto, 2013). The environment of long working hours also doesn't support women career advancement in Japanese organizations, intensifies the separation between work and family (Nemoto, 2013). Gender diversity has a central place within CSR policies and practices. The literature argues for a significant bi-directional relationship between CSR and board diversity, since gender-diverse boards provide more effective monitoring of CSR performance (Bear et al, 2010; Harjoto et al., 2015; Williams, 2003). Vice versa, Sugita (2006) suggested that CSR should support a mechanism to promote gender equality in organizations and link with work-life balance. Tanimoto (2017) noted about increased number of CSR employees since this activity started in Japan in 2003.

Mun and Jung (2018) investigated how Japanese firms responded to global standards of CSR norms in terms of gender diversity in the workplace and added that CSR used to be attracted to external investors In their comparative study of Germany and Japan, Kemper et al. (2016) pointed that Japanese organizations expect more negative outcomes from diversity practices than the German ones. Kato and Kodama (2016) connect work-life balance practices and CSR and suggested CSR practices positively impact on gender diversity in the workplace even though not immediately after the inception of CSR but after two to three years. There is study of Fontana (2019) who critically observed CSR as "an emotionally tainted occupation" in Japan, confirmed that CSR in Japan is used for public recognition, while the workers in CSR field feel themselves useless. Other scholars who confirmed the Japanese workplace is still contradictory even with CSR policies (Mun and Jung, 2018; Kimura and Nishikawa, 2018). Concerning HRM, Japanese organizations implement more top-down HR practices, since such an approach is believed to be more effective, because in Japan the rules applied by superiors and based on a high-context culture with many unwritten rules are always strictly followed (Sekiguchi et al., 2016). HRM in Japanese organizations was successful with in the internationalization of operations management but not in the internationalization of management, characterizing by ethnocentric management style (Sekiguchi at al., 2016). There is big chance to be discriminated through HRM practices, like selection, evaluation or promotion (Aygan, 2004). Magoshi and Chang (2009) evidenced the implementation of gender related HRM practices is notably weaker compared to western companies. Nevertheless, HRM practices such as work-life balance and family-friendly policies have proved helpful for the career development of women (Yanadori and Kato, 2009; Wakisaka, 2007) but also for organization's performance (Wakisaka, 2007). There evidence that recent HRM practices use flexible employment and performance-related payments (Sekiguchi, 2013).

3.3. The inter-personal and personal level

A significant amount of research on workplace gender diversity has addressed diversity within workplace teams proposing two opposing perspectives: social categorization suggests that diversity brings dysfunctional teamwork and conflicts and negative impacts on performance. Conversely, the information/decision making perspective suggests that diversity will bring more creativity, better decision-making. Van Knippenberg et al., (2004) and their Categorization-Elaboration Model (CEM) integrate the two above mentioned concepts, by arguing that both processes unfold simultaneously. According to CEM, the social categorization processes caused by diversity lead to affective and evaluative reactions that moderate the main relationship between diversity and elaboration of task-relevant information and perspectives, which in turn influence group/organizational performance. CEM points to the importance of other moderating variables at team level that strengthen benefits from diversity (e.g. specialization and task complexity, effective conflict management, leadership), which had previously been overlooked. Therefore, through the analysis of moderating effects, both positive and negative outcomes can stem from increased diversity in the workgroup (Jackson et al, 2003; Van Knippenberg and Schippers, 2007). Consistent with the above, gender diverse teams seem to focus on the task accomplishment and have more formal job behavior (Schneid et al., 2015). Intersectionality theory suggests that people are members of more than one category or social group and examines the ways in which social and cultural categories interact and intertwine. (Acker, 2006; Richadson and Loubier, 2008; Zander et al., 2010). Along the same lines, Faultline theory (Lau and Murninghan, 1998; Van Knippenberg et al., 2010) suggested that diversity dimensions should be considered in conjunction to understand the overall impact of diversity within a team. Therefore, these theoretical approaches posit that gender will interact with other sources of social status/categorization, e.g. nationality, educational background, class, and ethnicity (Zander et al., 2010).

According to Gottfried (2008), Japan invented a monolithic culture through filtering Japanese/non-Japanese. With respect to gender, Adler (1987) found that foreign women in Japan are perceived not as women, meaning less discrimination compared to Japanese women. According to gender studies women are more associated with caring, empathy and concern others (Fondas, 1997). Such stereotypes, which put pressure on women to comply with that particular behavioural model (Gutek and Morasch, 1982; Boulouta, 2013), could be felt more strongly by Japanese women than by foreign ones. Women managers are expected to follow masculine work norm and prioritize work over personal and family matters (Nemoto, 2012). Women who choose career often remain single or childless to avoid "double pressure of being good workers nad mothers" (Nemoto, 2013, p. 524). The literature on women's career advancement discussed individual and situational factors (Aycan, 2004). The personal factors include attitude toward career development: high level of self-efficacy, strong desire to succeed, positive attitude toward relocation, higher level of education, having extensive working experience and knowledge: with these factors' women have better chances of being in decision-making positions (Aycan, 2004; Adler, 1993; Adler et al., 2000). In Japanese context a Japanese person is normally being silent which equals to being polite or modest, that's why women hesitate to speak up and self-present to behave as expected by society (Takano, 2005). The discrimination is often more apparent at the inter-personal level than within the organization as a whole. In the relation with peers, women feel discriminated in their ability to express their opinions and contribute to decisions because of the existence of strong male cliques within work teams. Japanese media still supports traditional gender roles and societal expectation shows the female character as being house wife (Arima, 2003; Aono and Kashiwagi, 2011) and on the same time showing more stories about women in politics. Recently, in the Japanese mainstream and public discourse Entrepreneurship is offered as a solution to work-life balance, portraying a female as a "superwoman" (Bobrowska and Conrad, 2017), pushing to be responsible for family obligations and being pioneers in male-dominated industries as women. In general, situational factors may influence on women career advancement, as well as role models. There is lack of female role models in Japanese organizations (Yoshida, 2018), in most cases mothers play key role in creating self-confidence and ambitions for career (Aycan, 2004) or in the contrary due to negative image of the mother as being housewife can force women to choose career over marriage (Nemoto, 2008). The recent study of Kuroda and Yamamoto (2018) showed that the relationship between a supervisor and employees affect employees' productivity and well-being and bosses' management and communication skills are critical to improve worker's well-being. Personal traits of the supervisor are essential and predict the outcomes in social aspects. Still Japan characterized by gender differentiation and professional career often associated with male-gender (Hirsch, 2000; Ogasawara, 1998).

4. CONCLUSIONS

This study has organized the literature on workplace gender diversity in Japan based on several layers of factors. Five main areas of research were identified: Japanese culture, political institutions in Japan, organizational changes through the prism of HRM and CRM practices, inter-personal and personal issues that can support or hinder gender diversity and inclusion in Japan. The literature review showed the scarcity of empirical evidence, in particular with respect to the role of personal factors. Additionally, there is no evidence on the impact of moderators of diversity at team level, e.g. if specializazion and task complexity or team tenure can moderate the link with women participation in decision-making. Next, most of the studies cover problems and issues the women face during career advancement, however there is not much evidence of "success stories", what the triggers and key factors of such favourable outcomes are. Finally, institutional pressures engender higher gender diversity and better practices for women inclusion in organizational decisions.

However, even if Japanese women are promoted and ready for career advancement, the workplace situation will be not changed without changes in the work-life balance of Japanese men. Therefore, future studies should investigate whether men in Japanese organizations are ready to change and move forward in support of women in child-care and how this new balance can be promoted.

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COVEY'S 7HABITS AND THE BIG FIVE PERSONALITY TRAITS: CURE FOR HIGH NEUROTICISM?

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ABSTRACT

Stephen Covey's Seven Habits of the Highly Effective People is a long standing corporate training aiming at the broadly understood personal development of the participants including not just narrowly work-related attitudes but relationships, long term personal goals, personal integrity, developing a personal philosophy, and work-life balance in general for long lasting human effectiveness and success. Covey's practical guide has merits according to and fits well in the tradition of positive psychology. This was concluded in theoretical terms based on a recent study by Szerdahelyi and Komlósi (2020), moreover a 7Habits scale was developed and psychometrically validated. The authors in this new article take the next steps to look at the 7Habits from the point of view of the Big Five Personality Traits. Using multiple regression models, we mostly take an exploratory approach as to what relationships are significant statistically and relevant in terms of strength. Major expectations as to how personality traits may relate to the 7Habits are formally hypothesized, but in all cases, implications are drawn from the results and discussed also in practical training terms.

Keywords: *Big Five Personality Traits, Corporate Trainings, Covey's 7Habits, Positive Psychology*

1. LITERATURE REVIEW AND HYPOTHESES DEVELOPMENT

1.1. The 7Habits' content and related literature

The Seven Habits of the Highly Effective People by Stephen Covey (1989) was only recently put under the test of psychological coherency and psychometric validity. Szerdahelyi and Komlósi in their 2020 article explored the positive psychological basis, measurement and outcomes of Covey's 7Habits. Previous peer reviewed literature on Covey's framework (Jackson, 1999; Mccabe, 2011; Starck, 1995; and Millar, 2013) avoided questions of compatibility between current psychological research and the 7Habits, also no measurement tool was reported in the literature. In their 2020 research paper Szerdahelyi and Komlósi showed that Self-determination theory (SDT) (Deci and Ryan, 2000) theoretically is compatible to Covey's framework, moreover, through the scale they developed and psychometrically validated they showed that the 7Habits are predictive of the basic need satisfaction scales of autonomy, competence and relatedness of SDT. The 7Habits is a complex personality training accessible through training sessions or individual reading. In short we now recap the 7Habits content. Habit 1 is "Be proactive". Habit 1, as Covey put it in his talks, is about "realizing that each of us is the programmer of their lives". Habit 2 is "Begin with the end in mind". Habit 2 is about writing the program for ourselves that we want to run on. Habit 3 is "Put first things first". Habit 3 is running the program: executing. The first three Habits are part of what Covey calls Private Victory that leads to Independence. In our regression models we will not only focus on the 7Habits as a whole, but also on each Habit individually and also on Private Victory as a separate entity that aggregates Habit 1 to 3. Habit 4 is "Think win-win".

Is about the abundance mentality, that there is enough for both of us, thus enabling us to look also for the "win" of the other person. Habit 5 is "Seek first to understand then to be understood". This is the communication strategy of the 7Habits. You will better know what to do or say when you first understand the other, moreover other will be more inclined to be influenced by you if they first feel understood. Habit 6 is "Synergy with others". Looking for alternatives together that are better. Habit 7 is "Sharpen the saw". This is the maintenance Habit. In Covey's framework Habits 4 to 6 are aggregated in the Public Victory that leads to Interdependence, and Habit 7 stands alone. In our present research we group Habit 7 to the Public Victory for practical reasons because in the 12 item 7Habits scale Habit 7 is a relational item. In our regression models we focus on each Habit individually and also on Public Victory as a separate entity that aggregates Habit 4 to 7.

1.2. The Big Five Personality Traits and the 7Habits

The Big Five personality traits model of personality has been developed since the 80s and today it is the most prevalent psychological personality model that has massive psychometric evidence in support of (Rothmann and Coetzer, 2003). In this model the five personality traits are openness to experience, conscientiousness, extraversion, agreeableness and neuroticism. In None of the dimensions are good or bad, rather, they describe personality and the individual mix of the traits is what counts. Extreme low or high values are regarded as problematic, but both high or low values can have advantages on any given dimension. Openness to experience is the dimension where inventiveness or curiousness (if high) and consistency or cautiousness (if low) are measured. Conscientiousness is the dimension where efficiency or organized personality (if high) and extravagancy or carelessness (if low) are measured. Extraversion is the dimension where outgoingness or energetic personality (if high) and solitary or reserved personality (if low) are measured. Agreeableness is the dimension where friendly or compassionate (if high) and challenging or callous (if low) personality is measured. Neuroticism is the dimension where sensitive or nervous (if high) and resilient or confident (if low) personality is measured. In our study we use the Rammstedt and John (2007) 10 item version of the Big Five inventory which is adequate to draw conclusions to the relationships of the personality dimensions and other psychological variables also according to the literature critical of the short scales (Credé, Harms, Niehorster, Gaye-Valentine, 2012). Personality traits and habits can be predictive of each other. In our research we focus on the question to what degree are personality traits predictive of the 7Habits as a whole and also of the individual Habits and also of Private and Public Victory all of which are elements of Covey's framework. In general, we take an inquisitive or exploratory approach and we will draw conclusions based on all of the results of the linear regression models. Nevertheless, we take care to formulate three formal hypothesis that highlight our general expectations about the results of the 45 regression models that we run. We expect that when the complex 7Habits variable is put in relation to the five personality dimensions neuroticism will be inversely predictive while the other dimensions excluding Extraversion will be predictive of the 7Habits. This is because the content of the 7Habits implies orderliness, and openness, trust towards others, while the outgoingness and sociability don't seem to be an intensively related dimension.

- **Hypothesis 1:** The 7Habits latent variable is positively related to Agreeableness, Conscientiousness and Openness while negatively related to Neuroticism.

We expect that when Habits 1 to 3 and the Private Victory variables are put in relation to the five personality dimensions Conscientiousness will be the most relevant predictor. This is conscientiousness seems to be central to the first three habits.

- **Hypothesis 2:** Private Victory and related Habits dominantly will be positively related to conscientiousness.

We expect that when Habits 4 to 7 and the Public Victory variables are put in relation to the five personality dimensions the socially relevant traits that is Extraversion, Agreeableness and Openness will be the most relevant predictors.

- **Hypothesis 3:** Public Victory and related Habits dominantly will be positively related to Extraversion, Agreeableness and Openness.

2. METHOD

The 7Habits construct (Szerdahelyi and Komlósi, 2020) and the Big Five personality traits were measured and linear regression was used to determine their relationship. Following Covey's original framework the we created two subgroups within the 12 item 7Habits scale which are called Private Victory and Public Victory. Also, the items belonging to each Habit were grouped separately (as per Table 1). For each group we run five regression models separately for each personality dimension in order to get a multilayered view of the relationships between the personality and the 7Habits. Figure 1 represents the created groups. Although the 7Habits construct loads all 12 items on a single 7Habits latent variable (Szerdahelyi and Komlósi, 2020), it seemed appropriate to proceed with the grouping of the items representing different elements in Covey's framework and create regression models for each. The regression models indicate the strength (R2), direction (beta) and statistical significance (p) of the relationship of the variables, which are discussed in the Discussion session. Computations are executed with R statistical software (R core team, 2017).

<table>
<tr><td colspan="7">The Seven Habits</td></tr>
<tr><td colspan="3">Private Victory</td><td colspan="4">Public Victory</td></tr>
<tr><td>Habit 1</td><td>Habit 2</td><td>Habit 3</td><td>Habit 4</td><td>Habit 5</td><td>Habit 6</td><td>Habit 7</td></tr>
</table>

Figure 1: The 7Habits framework (Source: The authors' creation)

2.1. Sample

For this study we used the same data set that was used to develop the 7Habits scale (Szerdahelyi and Komlósi, 2020). This sample was described as follows. "The Budapest office of the tech company comprises in total 58 people (31 male and 27 female employees). A total of 53 people were knowledge-workers in the fields of IT and business. HR, finance and assistance make up 5 people. Given the relatively small sample size, no distinction was made between areas of responsibility within the employee survey. Although the surveys were not obligatory, management recommended highly to participate, therefore 52 people (~90%) filled in the employee survey. The final sample size for the analysis was 52."

2.2. Measures

For all survey questions a 6 point Likert-like scale was used where 1 meant "Strongly disagree" and 6: "Strongly agree". Questionnaires were combined and taken together by the participants. *The seven habits.* Covey's framework was measured with the 7Habits 12 item scale that was developed by the authors of this paper in a previous study (Szerdahelyi and Komlósi, 2020). The 12 items of the scale were deduced with content and psychometric analysis to be reasonably representative of the whole 7Habits framework and also to show acceptable psychometric

quality. All 12 items load on one 7Habits latent variable indicating a good fit in confirmatory factor analysis (Hu and Bentler, 1999), but items are grouped according to content to represent each Habit as shown in Table 1. As per Covey's framework the Habits themselves are grouped into Private Victory representing Habits 1 to 3 and Public Victory representing Habits 4 to 7. The grouping per Habits and Victory level also used as separate entities in the linear regression models are derived based on content only while psychometrically not forming a separate latent unit in the 12 item 7Habits construct. In the future, more detailed 7Habits scales may be necessary to prove or disprove whether the Habits and the Victory levels on Covey's framework make separate psychometric sense or not.

Item No.	Item text / Habit
	1. Be proactive
1	I focus on things that have an impact
2	I feel responsible for what I do and don't do
	2. Begin with the end in mind
3	Before starting something new, I think about how it helps me achieve my goals
4	I feel motivated by my goals
	3. Put first things first
5	I start with the difficult tasks that have the most added value
6	I am often overwhelmed by urgent tasks and requests (R)
	4. Think win-win
7	I am open and clear about what I need and what I can do for others
8	I believe that life is full of opportunities for everybody
	5. Seek first to understand then to be understood
9	While listening to somebody I am already thinking about what my response will be (R)
10	I make sure that the other person feels understood by me
	6. Synergy with others
11	I build on the strengths of others to get something done
	7. Sharpen the saw
12	I engage in lasting relationships and friendships

Table 2: Items of the 7Habits scale (Source: The authors' creation)

The Big Five Personality Traits. We used the Rammstedt and John (2007) short version of the Big Five Inventory which has 2 items for each trait. This short scale shows respectable integrity and is acceptable to be used to detect relationships or distinctness of the Big Five traits even according to the critical literature on short personality scales (Credé, Harms, Niehorster, Gaye-Valentine, 2012).

Table following on the next page

Independent variables	***beta***	***se***	***t***	***F***	***df***	***p***	***R2***
Extraversion on the 7Habits	.091	.044	2.044	4.179	1, 49	.046	.078
Agreeableness on the 7Habits	.170	.037	4.60	21.18	1, 49	.000	.301
Conscientiousness on the 7Habits	.141	.039	3.542	12.55	1, 49	.000	.203
Neuroticism on the 7Habits	-0.218	.043	-4.981	24.81	1, 49	.000	.336
Openness on the 7Habits	.122	.048	2.549	6.499	1, 49	.013	.117
Extraversion on Private Victory	.382	.246	1.549	2.4	1, 49	.127	.027
Agreeableness on Private Victory	.879	.234	3.748	14.05	1, 49	.000	.222
Conscientiousness on Private Victory	0.942	.227	4.137	17.12	1, 49	.000	.258
Neuroticism on Private Victory	-0.781	.189	-4.119	-4.119	1, 49	.000	.257
Openness on Private Victory	.373	.224	1.66	2.755	1, 49	.103	.053
Extraversion on Public Victory	.473	.224	2.113	4.465	1, 49	.039	.083
Agreeableness on Public Victory	.887	.211	4.194	17.59	1, 49	.000	.264
Conscientiousness on Public Victory	.501	.234	2.137	4.568	1, 49	.037	.085
Neuroticism on Public Victory	.760	.172	-4.405	19.41	1, 49	.000	.283
Openness on Public Victory	.582	.197	2.951	8.708	1, 49	.004	.15
Extraversion on Habit 1	.117	.096	1.221	1.492	1, 49	.227	.02
Agreeableness on Habit 1	.2367	.096	2.442	5.965	1, 49	.018	.108
Conscientiousness on Habit 1	.420	.082	5.098	25.99	1, 49	.000	.346
Neuroticism on Habit 1	-0.284	.074	-3.82	14.59	1, 49	.000	.229
Openness on Habit 1	.023	.089	.268	.071	1, 49	.789	.001
Extraversion on Habit 2	.136	.143	.953	.908	1, 49	.345	.018
Agreeableness on Habit 2	.517	.132	3.895	15.17	1, 49	.000	.236
Conscientiousness on Habit 2	.273	.145	1.875	3.515	1, 49	.066	.066
Neuroticism on Habit 2	-0.333	.116	-2.866	8.214	1, 49	.006	.143
Openness on Habit 2	.132	.130	1.013	1.026	1, 49	.316	.020
Extraversion on Habit 3	.128	.095	1.351	1.826	1, 49	.182	.035
Agreeableness on Habit 3	.125	.1	1.247	1.554	1, 49	.218	.03
Conscientiousness on Habit 3	.248	.095	2.607	6.799	1, 49	.012	.121
Neuroticism on Habit 3	.163	.081	-2.011	4.043	1, 49	.049	.076
Openness on Habit 3	.217	.083	2.613	6.828	1, 49	.011	.122
Extraversion on Habit 4	.109	.1	.096	.202	1, 49	.278	.023
Agreeableness on Habit 4	.306	.097	.15	9.921	1, 49	.002	.168
Conscientiousness on Habit 4	.154	.103	1.488	2.215	1, 49	.143	.043
Neuroticism on Habit 4	-0.329	.074	-4.415	19.5	1, 49	.000	.284
Openness on Habit 4	.128	.09	1.41	1.987	1, 49	.165	.0389
Extraversion on Habit 5	.131	.109	1.199	1.437	1, 49	.236	.028
Agreeableness on Habit 5	.199	.113	1.755	3.078	1, 49	.085	.059
Conscientiousness on Habit 5	.219	.112	1.956	3.826	1, 49	.056	.072
Neuroticism on Habit 5	-0.285	.087	-3.251	10.57	1, 49	.002	.177
Openness on Habit 5	.164	.098	1.667	2.778	1, 49	.101	.053
Extraversion on Habit 6	.003	.087	.045	.002	1, 49	.964	.000
Agreeableness on Habit 6	.165	.089	1.86	3.461	1, 49	.068	.065
Conscientiousness on Habit 6	-0.076	.090	-0.838	.702	1, 49	.406	.014
Neuroticism on Habit 6	-0.057	.075	-0.763	.582	1, 49	.448	.011
Openness on Habit 6	.084	.079	1.071	1.147	1, 49	.289	.022
Extraversion on Habit 7	.228	.069	3.271	10.7	1, 49	.001	.179
Agreeableness on Habit 7	.215	.075	2.871	8.242	1, 49	.006	.144
Conscientiousness on Habit 7	.203	.075	2.705	7.319	1, 49	.009	.13
Neuroticism on Habit 7	-0.087	.066	-1.329	1.766	1, 49	.19	.034
Openness on Habit 7	.204	.064	3.188	10.16	1, 49	.002	.171

Table 2: Regression Analysis of Big Five personality traits on the 7Habits
(Source: The authors' creation)

3. RESULTS

In the Results section we detail the results of the linear regression models that we run in order to calculate the strength of the relationships between the Big Five personality traits and the 7Habits construct. The 7Habits is measured as one latent variable on which the12 items load and these items are representative of the 7 habits. In order to follow the logic of Covey's framework and be able to deduce meaningful conclusions per Habit and per Private Victory (including Habit 1 to 3) and the per Public Victory (including Habit 4 to 7), we run linear regressions for each subcomponent of the 7Habits construct.

3.1. The Big Five Personality Traits and the 7Habits as a whole

We first tested the models measuring the relationship between the 12 item 7Habits construct and each of the Big Five traits. The linear regression model measuring the effect of Extraversion on the 7Habits is beta .091, se .044, t 2.044, F 4.179 and R2 .078 with significance level p .046. That of Agreeableness on the 7Habits is beta .170, se .037, t 4.60, F 21.18 and R2 .301 with significance level p .000. Conscientiousness on the 7Habits has an effect of beta .141, se .039, t 3.542, F 12.55 and R2 .203 with significance level p .000. While the effect of Neuroticism on the 7Habits is beta -0.218, se .043, t -4.981, F 24.81 and R2 .336 with significance level p .000. Finally, the effect of Openness on the 7Habits is beta .122, se .048, t 2.549, F 6.499 and R2 .117 with significance level p .013.

3.2. The Big Five Personality Traits and the Privat Victory

Second, we tested the models measuring the relationship between Private Victory – making up the first 6 items of the 7Habits construct including Habits 1 to 3 – and each of the Big Five traits. The linear regression model measuring the effect of Extraversion on Private Victory is beta .382, se .246, t 1.549, F 2.4 and R2 .027 with significance level p .127. That of Agreeableness on Private Victory is beta .879, se .234, t 3.748, F 14.05 and R2 .222 with significance level p .000. Conscientiousness on Private Victory has an effect of beta 0.942, se .227, t 4.137, F 17.12 and R2 .258 with significance level p .000. While the effect of Neuroticism on Private Victory is beta -0.781, se .189, t -4.119, F -4.119 and R2 .257 with significance level p .000. Finally, the effect of Openness on Private Victory is beta .373, se .224, t 1.66, F 2.755 and R2 .053 with significance level p .103.

3.3. The Big Five Personality Traits and the Public Victory

Third, we tested the models measuring the relationship between Private Victory – making up the last 6 items of the 7Habits construct including Habits 4 to 7 – and each of the Big Five traits. The linear regression model measuring the effect of Extraversion on Public Victory is beta .473, se .224, t 2.113, F 4.465 and R2 .083 with significance level p .039. That of Agreeableness on Public Victory is beta .887, se .211, t 4.194, F 17.59 and R2 .264 with significance level p .000. Conscientiousness on Public Victory has an effect of beta .501, se .234, t 2.137, F 4.568 and R2 .085 with significance level p .037. While the effect of Neuroticism on Public Victory is beta .760, se .172, t -4.405, F 19.41 and R2 .283 with significance level p .000. Finally, the effect of Openness on Public Victory is beta .582, se .197, t 2.951, F 8.708 and R2 .15 with significance level p .004.

3.4. The Big Five Personality Traits and Habit 1: Be proactive

Then, we tested the models measuring the relationship between each Habit and the Big Five traits. The linear regression model measuring the effect of Extraversion on Habit 1 is beta .117, se .096, t 1.221, F 1.492 and R2 .02 with significance level p .227. That of Agreeableness on Habit 1 is beta .2367, se .096, t 2.442, F 5.965 and R2 .108 with significance level p .018.

Conscientiousness on Habit 1 has an effect of beta .420, se .082, t 5.098, F 25.99 and R2 .346 with significance level p .000. While the effect of Neuroticism on Habit 1 is beta -0.284, se .074, t -3.82, F 14.59 and R2 .229 with significance level p .000. Finally, the effect of Openness on Habit 1 is beta .023, se .089, t .268, F .071 and R2 .001 with significance level p .789.

3.5. The Big Five Personality Traits and Habit 2: Begin with the end in mind

The linear regression model measuring the effect of Extraversion on Habit 2 is beta .136, se .143, t .953, F .908 and R2 .018 with significance level p .345. That of Agreeableness on Habit 2 is beta .517, se .132, t 3.895, F 15.17 and R2 .236 with significance level p .000. Conscientiousness on Habit 2 has an effect of beta .273, se .145, t 1.875, F 3.515 and R2 .066 with significance level p .066. While the effect of Neuroticism on Habit 2 is beta -0.333, se .116, t -2.866, F 8.214 and R2 .143 with significance level p .006. Finally, the effect of Openness on Habit 2 is beta .132, se .130, t 1.013, F 1.026 and R2 .020 with significance level p .316.

3.6. The Big Five Personality Traits and Habit 3: Put first things first

The linear regression model measuring the effect of Extraversion on Habit 3 is beta .128, se .095, t 1.351, F 1.826 and R2 .035 with significance level p .182. That of Agreeableness on Habit 3 is beta .125, se .1, t 1.247, F 1.554 and R2 .03 with significance level p .218. Conscientiousness on Habit 3 has an effect of beta .248, se .095, t 2.607, F 6.799 and R2 .121 with significance level p .012. While the effect of Neuroticism on Habit 3 is beta .163, se .081, t -2.011, F 4.043 and R2 .076 with significance level p .049. Finally, the effect of Openness on Habit 3 is beta .217, se .083, t 2.613, F 6.828 and R2 .122 with significance level p .011.

3.7. The Big Five Personality Traits and Habit 4: Think win-win

The linear regression model measuring the effect of Extraversion on Habit 4 is beta .109, se .1, t .096, F .202 and R2 .023 with significance level p .278. That of Agreeableness on Habit 4 is beta .306, se .097, t .15, F 9.921 and R2 .168 with significance level p .002. Conscientiousness on Habit 4 has an effect of beta .154, se .103, t 1.488, F 2.215 and R2 .043 with significance level p .143. While the effect of Neuroticism on Habit 4 is beta -0.329, se .074, t -4.415, F 19.5 and R2 .284 with significance level p .000. Finally, the effect of Openness on Habit 4 is beta .128, se .09, t 1.41, F 1.987 and R2 .0389 with significance level p .165.

3.8. The Big Five Personality Traits and Habit 5: Seek first to understand then to be understood

The linear regression model measuring the effect of Extraversion on Habit 5 is beta .131, se .109, t 1.199, F 1.437 and R2 .028 with significance level p .236. That of Agreeableness on Habit 5 is beta .199, se .113, t 1.755, F 3.078 and R2 .059 with significance level p .085. Conscientiousness on Habit 5 has an effect of beta .219, se .112, t 1.956, F 3.826 and R2 .072 with significance level p .056. While the effect of Neuroticism on Habit 5 is beta -0.285, se .087, t -3.251, F 10.57 and R2 .177 with significance level p .002. Finally, the effect of Openness on Habit 5 is beta .164, se .098, t 1.667, F 2.778 and R2 .053 with significance level p .101.

3.9. The Big Five Personality Traits and Habit 6: Synergize with others

The linear regression model measuring the effect of Extraversion on Habit 6 is beta .003, se .087, t .045, F .002 and R2 .000 with significance level p .964. That of Agreeableness on Habit 6 is beta .165, se .089, t 1.86, F 3.461 and R2 .065 with significance level p .068. Conscientiousness on Habit 6 has an effect of beta -0.076, se .090, t -0.838, F .702 and R2 .014 with significance level p .406.

While the effect of Neuroticism on Habit 6 is beta -0.057, se .075, t -0.763, F .582 and R2 .011 with significance level p .448. Finally, the effect of Openness on Habit 6 is beta .084, se .079, t 1.071, F 1.147 and R2 .022 with significance level p .289.

3.10. The Big Five Personality Traits and Habit 7: Sharpen the saw

The linear regression model measuring the effect of Extraversion on Habit 7 is beta .228, se .069, t 3.271, F 10.7 and R2 .179 with significance level p .001. That of Agreeableness on Habit 7 is beta .215, se .075, t 2.871, F 8.242 and R2 .144 with significance level p .006. Conscientiousness on Habit 7 has an effect of beta .203, se .075, t 2.705, F 7.319 and R2 .13 with significance level p .009. While the effect of Neuroticism on Habit 7 is beta -0.087, se .066, t -1.329, F 1.766 and R2 .034 with significance level p .19. Finally, the effect of Openness on Habit 7 is beta .204, se .064, t 3.188, F 10.16 and R2 .171 with significance level p .002.

4. DISCUSSION

45 linear regression models have been run on the 7Habits and the component groups defined as Private and Public Victory and as the 7 Habits. Our general expectations are confirmed, but there are also surprising results which highlight opportunities or betray the weaknesses of the scales applied. Looking at the models where the 7Habits construct as a whole was predicted by the five personality dimensions all came out as statistically significant although not all very relevant in terms of degree or strength. Extraversion was the weakest predictor as per our hypothesis, although still significant. Neuroticism curiously came out as the dominant predictor of the 7Habits followed closely by Agreeableness. Neuroticism is inversely related to the 7Habits variable which means that the lower the Neuroticism trait the higher the 7Habits variable in general on our sample. This is true for most levels of analysis to follow. The conclusion to discuss in terms of training and practice is that maybe people high on Neuroticism could be helped by practicing the Seven Habits, provided that we assume that the relationship is reversable in practice and good habits can help to compensate for high Neuroticism trait. Agreeableness is also surprisingly the second most powerful predictor of the 7Habits, whereas it was assumed that it would be mostly predictive of Public Victory and related Habits. Looking at the models where the Private Victory (encompassing the Habits of Independence) was predicted by the five personality dimensions only three came out as statistically significant. Conscientiousness was expected to be the most powerful predictor, which is so, but only by a negligible margin: Neuroticism inversely is almost as predictive, while curiously Agreeableness is also strongly predictive. Looking at the models where the Public Victory (encompassing the Habits of Interdependence) was predicted by the five personality dimensions all came out as statistically significant, however curiously extraversion is the least important predictor. Conscientiousness is also very weak, however this was expected. According to the pattern so far observed, Neuroticism is the strongest predictor (inversely) of the Public Victory, followed by Agreeableness and finally by Openness to experience. We also run regression models for each of the Habits. In Hypothesis 2 we suggested that for Habits 1 to 3 Conscientiousness would be the dominant predictor. In the case of Habit 1 (Be proactive!) this is clearly so with Neuroticism (reversed effect) being in the second place. In the case of Habit 2 (Begin with the end in mind) however Conscientiousness is not a strong predictor. Agreeableness is the leading predictors, while Neuroticism is also significant. This result doesn't seem to fit with theory about the personality traits or the 7Habits, therefore it is either reflective of a measurement error or implies the inadequacy of the 7Habits items referring to Habit 2. As for Habit 3 (Put first things first) Conscientiousness and Openness are equally (and neither of them very strongly) predicting of the Habit. The former is according to our Hypothesis 2 and the latter is an interesting additional finding. As for Habit 4 (Think Win-Win), Neuroticism is the strongest (invers) predictor according to the trend discovered across most regression models.

Agreeableness as per our Hypothesis 3 is also a rather strong predictor, however Extraversion and Openness are not significant. As for Habit 5 (Seek first to understand and then to be understood) only the invers effect of Neuroticism is statistically significant contrary to Hypothesis 3. Habit 6 (Synergize with others) didn't have any significant predictors as per our regression models. Habit 7 (Sharpen the saw) which in the case of the 12 item 7Habits scale is really about the quality of relationships, is as per Hypothesis 3 showing as predictors Extraversion, Agreeableness and Openness. Results indicate that people low in Neuroticism and high in Conscientiousness and Agreeableness will be better at the 7Habits while Extraversion and Openness have less to do with the Habits. Assuming the premise that the relationship is reversable in the sense that by practicing the Habits one can compensate for certain low personality traits, the Seven Habits training and practicing the Habits could compensate for lower levels of Conscientiousness, Agreeableness and higher levels of Neuroticism. The strongest and most consistent predictor of the Habits was Neuroticism in reverse, therefore from a personality perspective practicing the Habits may be come most handy for those who are high in Neuroticism.

5. LIMITATIONS AND CONCLUSIONS

The 45 regression models run on the 12 7Habits items and the Big Five personality traits revealed to a large extent the predicted relationships while as a major surprise came that Neuroticism was with few exceptions the top predictor of the 7Habits and its components. From a training and personality perspective, the practicing or learning about the Seven Habits may be most helpful to those who would like to compensate for low Conscientiousness and low Agreeableness and high Neuroticism. Results also indicate that those already high in Conscientiousness and Agreeableness and low in Neuroticism will do best in practicing the Seven Habits. The personality traits Extraversion and Openness are less related to the Habits. Certain relationships resulting from the regression models are not compatible with the theory of Seven Habits and the personality traits, therefore they either indicate a measurement error or the deficiency of the 7Habits scale. Both of these points are reflective of the limitations of this paper and are opportunities for future research. On the one hand larger sample sizes allow for more reliable measurements, on the other hand a more elaborate 7Habits scale is probably possible to develop with more items that would capture more of the content of the Seven Habits and would allow for a each of the Habits (or at least each group of Habits) to load on separate latent variables at factor analysis. A more complete 7Habits measurement tool may allow for more precise results when put in relation to the Big Five Personality Traits.

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FORMULA SAE AS A MODEL ENVIRONMENT TO INNOVATE AUTOMOTIVE PRODUCT DEVELOPMENT

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ABSTRACT

This paper introduces a novel methodology on how to downscale a comprehensive industrial problem into a model environment. The organizational properties of a Formula Society of Automotive Engineers (FSAE) racecar team and industrial automotive product development were analyzed based on the factors of the McKinsey 7S framework. Semi-structured in-depth interviews were conducted with FSAE and automotive industrial managers. Questions were synchronized and the insights of respondents were thoroughly analyzed. Results revealed that the most determining factors of similarity have emerged from the Skills, Staff and Structure sections while other sections have also shown strong similarities between FSAE and industry. Departments in both sectors are currently organized in functional structures but independent efforts are ongoing to reorganize towards a matrix structure. Power distance is low, and the role of mutual trust is significant, and engineers are interested in the development of a quality product with improved features. The skills that are required from employees are common in FSAE and industry. The outcomes revealed numerous common features between FSAE and industrial automotive product development. Thus, it was concluded that FSAE could be a relevant scaled environment to conduct the development and implementation of a new organizational model, that is based on Systems Engineering theory.

Keywords: *Formula SAE, Automotive Product Development, Automotive Ecosystems, Systems Engineering*

1. INTRODUCTION

Automotive products became so complex in terms of requirements and functionality lately, that it might be timely to rethink the conventional product development processes,, otherwise complexity could reach an uncontrollable level that can impede effectivity and damage competitiveness of an vehicle manufacturer. As customer requirements transform, many companies offer smart product features and innovative transportation services (Ferràs-Hernández et al., 2017) (Stolfa et al., 2019). The common understanding of the term "automobile" has not changed fundamentally in the past decades. However, car manufacturers face today new challenges, predominantly in the areas of cyber technology issues for autonomous driving (Morris et al., 2018), emission restrictions (Klebaner, 2018) and sustainable development of electric powertrains. Naturally, the list could be even longer and thus, automotive giants tend to seek project-based alliances (Townsend et al., 2017) or even

consider revolutionizing their business model (Lasmar Jr. et al., 2019). Most of the recent automotive innovations concern software related or software-hardware integrity issues. The ecosystem that we have been assigned to cars in the past, has been changing significantly towards the integration of digital technologies. (Nischak and Hanelt, 2019) Recent studies about the new era of car industry not only deals with technological aspects. Donada and Attias (2015) claim that car manufacturers need to reposition automobiles in the future transportation system, in which it might be a complementary option among other solutions. They also highlight that automotive firms need to re-think their strategy, organization of innovation processes and the relationships between stakeholders. New manufacturers have emerged recently, which based their product development philosophy on completely new grounds. A profound case study, worked out by Agren et al. (2019), analyze practitioner views on their working standards with requirements regarding the intended system developments. These issues led us to Systems Engineering (SE), which is a comprehensive set of principles and theories, dealing with both technological and organizational aspects in order to develop complex systems effectively (Falk & Muller, 2019). The value of SE has been revealed by Elm (2008), who contributed with quantitative evidence, that in general, the projects with better SE capabilities are likely to deliver better performance. Vanek et al. (2017) approved this observation as they found that early investments on SE will result in better project outcomes when considering New Product Development. SE has widespread application in diverse industries, however, little evidence of successful implementation has been encountered for the automotive case. Loureiro (2004) applied a total view approach, although he justified SE through a review and a comparison of two case studies, while missing primary implementation. Dumitrescu et al. (2013) introduced an SE based model for variability management, but they discussed production-related aspects instead of product development. Hosseini & Welo (2016) published a proof-of-concept case study in the form of a student project, however they focused on the integration of SE with reliability engineering but missing any organizational impacts of a comprehensive SE framework. Clearly, there is a lack of literature on how to implement a SE based approach in its full context for automotive product development. This, with the advent of new functions, have reached such level of complexity, for which the traditional organization of the development process might no longer be suitable. Therefore, the overall goal of the research described in this paper is to develop a methodology for the implementation SE in the automotive product development phase. However, this phase is rather lengthy and expensive and therefore an implementation experiment in a scaled model environment appears to be a more attractive solution. This should share the same characteristics as the automotive sector but should have a much cheaper and faster development cycle, so that multiple implementation tests can be conducted in a relatively short time. This paper aims to demonstrate, that Formula SAE is a valid scaled model environment of the automotive sector in terms of technical development, i.e. the design and prototyping phase of developing a new mobility product.

2. MODEL ENVIRONMENT

2.1. Obstructions in industrial environment

Despite our motivations to experiment with SE approach in automotive product development, we find that such project is hardly feasible in industrial circumstances. The primary reasons are the following: (a) new product development cycle is long for research – normally it takes 3-6 years, which obviously precludes to gain validated results from the actual environment; (b) project costs run high – inherent changes of such experiment would generate high expenses in a multinational automotive giant organization; (c) requires in-depth change process – despite the demand for reorganization does exist, the openness of decision makers to immediately implement a new experimental model proposed by external researchers is questionable;.

Consequently, a model environment needs to be considered, which is appropriate to conduct experiments with SE based organizational models and to develop findings that are implementable in industrial circumstances.

2.2. Selection criteria

In order to select an appropriate model environment, we defined a number of criteria. According to our proposition, the model environment need to (a) have short development cycle in terms of time; (b) budgetary volume should be order of magnitudes lower than industrial product development; (c) show recognizable similarities in organizational properties and strategic goals; (d) should be agile and flexible to be able to easily realize the inherent changes in their organizational model. The Formula Society of Automotive Engineers (FSAE), in which high performing student teams deal with the development, prototyping and racing of single-seater formula prototype racecars, appear to provide an appropriate environment for our research as it (a) has a 9 month product development cycle, which is short; (b) the budgetary volume is in the order of tens of thousands of euros, which is relatively low; (c) it is also an automotive product development segment with similar goals in nature; (d) it is an agile organization working with normally 30-50 members. Additionally, the direct access and close relationship of the authors to the FSAE environment is already established. Having influence over the model environment might be critical to be able to steadily conduct any research experiment in the future.

2.3. Research objective

The main objective of this study is to reveal the organizational circumstances of two environments within the automotive product development segment, and assess whether they are similar in terms of main properties and therefore to enable to use FSAE as a model environment for implementing SE oriented organizational experiments.

3. METHODOLOGICAL FRAMEWORK

Considering our main research goal described above, we preferred to collect primary data with an in-depth interview technique rather than applying questionnaires, since sophisticated information on managerial experience can be more accurately reflected if respondents have the appropriate space to express their thoughts. Considering the fact that our study aims to provide findings based on a comprehensive organizational analysis, we decided to apply a qualitative method by conducting interviews with relevant experts of the two automotive sectors: FSAE and industrial R&D.

3.1. Interview structure

The McKinsey 7S framework served as the basis for our analysis because it is one of the most popular strategic planning tools for both academics and professionals, that provides valuable guidelines in the domain of organizational design. (Ravanfar, 2015) Even though the model has been frequently applied by practitioners and consultants over the past decades, recently, Sardos (2017) proposed a new look on the 7S framework. In addition to the fact that they proposed a revision on the names of the 7Ss, their view consists of modified positioning of the aspects on the graphical outline of the model, but no major content-related improvement was suggested. For our particular research, this reconsideration is not essential as the 7S framework only provides a guide for the individually developed questions and we do not intend to deal with in-depth analysis concerning the McKinsey 7S model itself. Therefore, following the 7 elements enabled us to create a semi-structured interview guide, which is stated to be a proper tool for qualitative data collection, improving the trustworthiness of the research in several ways (Kallio et al., 2016).

In total, 27 questions were formulated, concerning specific subjects of each 'S' aspect that are critical for the automotive product development segment. The questions – among many other information, are listed in Table 2.

3.2. Data collection

In order to conduct a systematical comparison of the two sectors, essentially the same questions were asked from both sides. To enhance the trustworthiness of the collected data, we rigorously applied a selection criterion on the appointment of interviewees: the interviewee should have gained substantial managerial or strategic development experience in the automotive Technical Development sector or should have been employed by the same company for more than 5 years (for FSAE respondents more than 2 years). Industrial interviews were conducted with 7 managers or experts, delegated from 3 different well-known automotive manufacturers that are named as 'Company A, B and C' in this study, as the respondents' identity were agreed to be treated anonymously due to confidentiality reasons. All conversations with industrial interviewees were organized remotely, via video chat applications. The FSAE relevant data were collected by interviewing 8 experienced team members who are in managerial positions. The platform was varying though, depending on the availability of the interviewees. 4 conversations were conducted in person and video chat sessions were organized for the rest. In both cases, not only notes, but also voice recordings have been made and thoroughly processed following the actual interview session, in order to make sure that we capture all relevant bits of the provided information. Due to the application of the semi-structured interview guide, respondents were able to contribute with well-focused concise answers. In general, industrial managers responded to the questions with somewhat more substantial answers. The average duration of one conversation was about 75 minutes. The interviews were conducted over 6 weeks in May, June, and early July 2020.

3.3. Analysis of interview data

All interviews were thoroughly analyzed, key terms mentioned by interviewees were extracted and placed into the appropriate cell of a spreadsheet that was created in order to facilitate the systematic comparison of the answers and develop data patterns. Interview data then were subjected to in-depth analysis in two stages. First, FSAE and industrial data were analyzed separately in order to formulate a mean statement for a particular question, termed as "Aggregate Response" (AR), as well as to quantify the deviation from this statement via a so-called "Match Rate".

Q16: What are the most important motivating factors for your employees in general?		Match Rate
R1	"Competition with others. Execution – see the outcome of work. Positive feedbacks."	1
R2	"Participation on competitions. Reach good results. Recognition of work. Feeling of involvement."	1
R3	"Good vibes, positive atmosphere. ""Quality"" of people. Circumstances of work. Physical environment."	0,5
R4	"Season of competitions. Car design and manufacturing. Competition feeling. Learning ability from others."	1
R5	"Love of motorsport and races. Develop the best car we can."	1
R6	"Car building. Racing spirit. Improvement of professional skills."	1
R7	"See the return of invested work. See the development and assembly of the car. Learning."	1
R8	"Good vibes. Good results."	0,5
AR	Competition. Building a racecar. Seeing the result of work investment.	
AMR	0,875	

Table 1: Example of the evaluation methodology for Question 16 from the FSAE pattern

Table 1 illustrates the methodology that was applied at the evaluation for the specific case of the FSAE pattern, Question no. 16. Remarks from the 8 respondents were ordered in 8 rows marked with "R#" (from R1 to R8). Excerpts of individual answers were noted, and an average response was formulated and termed as "Aggregate Response (AR). This served as the reference. Then, the deviation from this reference answer was quantified via a three-point scale called "Match Rate" (MR). The Match Rate was "1", if a response matched with the reference one in essence, "0,5" was given, when a response was partially different but not contradictory to the reference, and "0" was added, when someone provided contradictory answer compared to reference response. Finally. the arithmetic average of the Matching Rates was calculated as the Aggregate Matching Rate (AMR), which indicated that how strong was the average statement (AR) from statistical point of view. The closer to 1, the stronger is the statement. Indicating AMR beside AR data is vital, as these elements were eventually compared from the FSAE and the industry in the second stage of the analysis. The same analysis was repeated for all 27 questions, for both the automotive and the FSAE sectors. The cumulative results are shown in Table 2. The ARs of the FSAE and automotive industry were analyzed side by side at each question and marked with "Strong Similarity" (S), "Acceptable Similarity" (A) and "Contradictory" (C) labels, as indicated in Table 2.

Question	FSAE AR	FSAE AMR	Industry AR	Industry AMR	Comparison (S/A/C)
Strategy (Aggregated relevance: 0,8333)					
1. What kind of strategic actions has the organization made recently to improve their position and competitiveness?	It is based on the total target score per season. Some processes have been redesigned.	1	Re-organization more towards matrix structure. Innovating processes	0,857	A
2. What are the most challenging trends in the environment that your organization needs to tackle and respond to?	E-drivetrain development. Recruitment / knowledge transfer.	0,875	E-drivetrain development. Emergence of new competitors. Changing customer needs.	1	S
3. Do employees understand the essence of corporate strategy and feel that strategic objectives apply to them?	Clear for everyone and team members do agree with it.	0,813	Mostly, they do.	0,786	S
Structure (Aggregated relevance: 0,875)					
4. How could you characterize the structure of your organization in terms of functionality?	Functional, but developing towards matrix.	0,875	Currently functional but developing towards matrix.	1	S
5. What principle or logic drove the design of the primary organizational structure?	Beside the departments, there are project/activity leaders too (e.g. monocoque project).	0,75	Disciplinary leadership and project leadership.	0,857	S
6. What are the key managerial positions within the company?	Department leaders are in key position.	0,75	First level managers. The department leaders.	0,786	S

7. Would you propose any significant change on the organizational structure?	Basically not, but inter-departmental connections should be developed.	0,75	Project structure needs more weight and power. Organization must be structured in order to better meet customer requirements.	0,786	A
Systems (Aggregated relevance: 0,8333)					
8. What type of systems do the company use for daily work?	To Do management. Text and video chat app. Gantt designer. Cloud storage.	1	Mobility working tools (communication, etc.). Digital tools: ERP systems, CAD systems.	0,857	S
9. What do you think about the system integrity level? Is there a development potential?	Some further development and consolidation needed.	0,75	Not sufficient, needs standardization and integration.	0,929	A
10. How these systems do support the overall organizational performance?	Increases work effectiveness and gain better results.	0,938	Many systems do support, however some need to be more process oriented.	0,5	S
Style (Aggregated relevance: 0,9)					
11. Do Board members receive information about sensitive issues properly?	Yes. By personal contacts	1	Yes, employees can contact leaders.	0,643	S
12. Are there formal or informal processes that facilitate raising employees' issues about their feedbacks?	Informally irregularly. Formally at performance evaluation sessions	0,875	Both formal and informal. E.g. anonymous surveys, mood measures	0,929	A
13. How much is the workplace atmosphere based on mutual trust?	Essentially important	1	Highly based on.	0,786	S
14. How great is the power distance at the company?	Power distance is low.	0,938	Power distance is low.	1	S
15. Is management open to upstreaming new ideas?	They are open to upstreaming new ideas.	0,813	Yes, new ideas are often considered.	0,786	S
Staff (Aggregated relevance: 0,8333)					
16. What are the most important motivating factors for your employees in general?	Competition. Building a racecar. Seeing the result of work investment.	0,875	Passion. Design of products. Respect. Recognition. Brand.	0,857	S
17. Do you apply any performance evaluation for team members? What are the key factors of it?	Yes, every half-a-year.	1	Yes, there is. Both personal and team performance goals are defined.	0,714	A
18. What efforts do management make to help new members' integration into the team?	Integration day and mentorship	0,813	Integration plan. Mentorship	0,857	S
Skills (Aggregated relevance: 1)					
19. What are considered as core competencies at your department?	Technical skills and engineering logic. Openness.	0,75	Engineering and technical skills in the specific area.	0,929	S

20. What are the essential soft skills requested from employees?	Teamwork ability. Proactiveness. Communication skills.	0,875	Teamwork ability. Communication skills. Proactiveness	0,929	S
21. What kind of training programs do the company offer for employees?	Yes, both hard and soft skills. Mostly internal trainings: self-education.	0,813	Lots of trainings, nearly for every position	1	S
22. Is knowledge sharing particularly supported? If yes, how is it supported?	Essential. Supported a lot. Knowledge base in the cloud.	1	Yes, it is. Corporate know-how is openly accessible to employees.	0,929	S
Superordinate goals (Aggregated relevance 0,8)					
23. What are the 3 most important core values of the company?	Team brand identity. Results and heritage. Team spirit.	0,938	Quality. Technology. Sustainability.	0,857	A
24. How do managers communicate these values towards their employees?	Continuously communicated both directly and indirectly (by behavior patterns).	0,688	They do, constantly.	1	S
25. Do employees accept them?	Yes, they do.	0,875	Yes.	0,786	S
26. Is there any intangible value that gets the whole organization together?	Yes.	1	Yes.	0,857	S
27. If yes, how has it evolved?	Originated from common interests and team spirit.	0,875	Common interests, to produce a great car	0,857	S

Table 2: Comparison of interview results from FSAE and industry

4. INTERVIEW RESULTS AND DISCUSSION

Generally, both FSAE and industrial patterns show satisfactory results in terms of AMRs recorded at any of the 27 questions. Nevertheless, Question 10 is an outlier with an AMR value of 0,5. Industrial managers provided significantly diverse answers to the question: "How do the systems support overall organizational performance?". A technical coordinator from Company A explained that "there are systems that do improve organizational performance as they helped the implementation of home office, for example". A senior manager at Company B argued that "it is hard to quantify the benefits of our systems", and an interviewee from Company C claimed that "we need to standardize our systems as they vary along the departments", otherwise their advantage cannot be utilized. Obviously, these answers are diverse and thus, the comparison results at this very question point is less significant. Promisingly, responses at the other points showed more homogeneous patterns. The top three most significant evidence for similarities between FSAE and industry is shown at questions Q8, Q14 and Q22, where both AMR values are high, therefore aggregate answers hit very high qualities, plus, the two ARs point out "Strong Similarity" on the three-point scale evaluation. The topmost similarity was recorded at question Q14, at which a strong consensus evolved about the low power distance in the corporate culture of both FSAE and industrial organizations. Considering the entire pattern 21 "Strong Similarities" and 6 "Acceptable Similarities", but zero "Contradictory" answers were encountered. Finally, aggregated relevance for each "S aspect" (i.e. Strategy, Structure, Systems, etc. in the table) was evaluated to indicate the volume of similarities between FSAE and industry. For this, the same evaluation code was used as in Table 1, i.e. 1 for "S", 0,5 for "A" and 0 for "C". Then, the average, or "aggregated relevance" was calculated based on this for each "S group".

Undoubtedly, the "Skills" stands out from all the other aspects as all subsections show "Strong Similarities". The first and second questions in this section were designed to reveal the hard and soft skills that are required from employees in the product development segment. Answers were exceptionally homogeneous, despite the fact that respondents could have easily added different terms due to the open nature of the two specific queries. FSAE and industrial managers agreed that technical competences and "ability to apply engineering logic" are essential hard skills on their field. On soft skills, all respondents mentioned teamwork ability among the most important factors, and enthusiasm, proactiveness and communication skills were also commonly used terms in the answers. The third question on skills concerned the type of training programs that are offered for employees by the company. Both segments provide courses for the improvement of hard and soft skills as well. There is a range of various training programs available, although industrial companies obviously organize them in a higher volume and somewhat more systematically. Nevertheless, in both cases organizations prefer to have control over their training programs and often organize courses by assigning their senior experts to coaches and thus, ensure that organization specific education will be provided for the colleagues. The last skills specific question guided the interviewees to the support of knowledge sharing within their organization. Consistently, everyone insisted the particular importance of this function and managers from both sides agreed that it is essential to maintain competitiveness and so colleagues are supported to share their knowledge with other members openly. There are both formal and informal ways to share know-how. In FSAE, managers explained that they have developed their own digital knowledge cloud, in which they store technical documentations in order to support future teamwork and support transparency. Similar circumstances between the two fields came out at "Style" and "Structure" as well. This observation is clearly visible in Fig. 1, which illustrates the relevance rates (shown in Table 2 for each "S" group and suggesting the volume of similarity between FSAE and industry) developed for each factor of the analysis on a spider chart.

Figure 1: Relevance rates illustrated on a spider chart

In "Style", we observe equivalently high significance of mutual trust in the workplace atmospheres, where managers can be contacted directly. Normally, board members are aware of any sensitive issues that might occur within the organization and employees are supported to discuss such issues in person with their superiors. In terms of "Structure", organizations are seeking the way to develop and reorganize their old shaped, silo-structures to a matrix format. Both FSAE and industrial respondents explained that currently their structure is mostly functional, however, they apply not only disciplinary but project leadership as well. This is a cross function that is realized temporarily, for example in the manufacturing phase of FSAE project, there is an assigned workshop leader who can coordinate members of any other disciplinary department as well. Moreover, despite the functional structure, roles are organized in a flat layout and processes are low on administration, plus brainstorming is highly supported. Even though industrial structures are obviously more extensive vertically, these few features might add an additional advantage to FSAE in terms of SE reorganization experiments.

5. CONCLUSION

Overall, the comparative analysis concerning organizational properties of the FSAE and the industrial sector of automotive product development show well-balanced similarities based on the elements of the McKinsey 7S model. Neither of the "Strategy, Structure, Systems, Style, Staff, Skills, Superordinate goals" aspects show outlying values in terms of the rate of similarity between the two automotive segments that are analyzed in our study. In other words, there is no factor, in which the positive relationship of the two fields is not clearly observable. Therefore, we can conclude that the Formula SAE field is indeed a valid scaled model environment for automotive industrial product development segment. Thus, FSAE provides a solid basis for our future research by enabling us to use it as a model environment to implement SE oriented organizational experiments. FSAE is a segment that enables us to develop valuable findings about the results of the implementation of a comprehensive Systems Engineering based model, by using a similar methodology to Hosseini and Welo (2016), but applying a total view approach (Loureiro et. al, 2004). Moreover, these findings underlie our previous assumption that future research outcomes developed from FSAE will be relevant and might be implemented in industrial circumstances as well. Outcomes of this study could provide R&D and innovation managers as well as researchers in the field important insights about approaching a complex development process via implementation tests of SE in a scaled model environment. Additionally, it highlights the relevance of FSAE as a special branch of the automotive sector, which could provide an appropriate environment to test innovative ideas and to serve as an innovation incubator. Also, in a later stage of our research stream, we expect to introduce a roadmap for industrial actors that includes best practices for managing innovation in an automotive development ecosystem effectively, in a way that it facilitates strategic adaptation to changing stakeholder requirements.

6. LIMITATIONS

In the end, we reveal two apparent limitations of our study.

First, despite the fact that answers developed homogenous patterns, interviewing more industrial managers and FSAE leaders could further improve the statistical trustworthiness of our results. Second, the McKinsey 7S based question guide concealed diverse key factors of an organization, therefore it enabled us to analyze characteristics in their complexity. However, developing an even more specified guideline for interviews might facilitate gaining more sophisticated results and therefore, provide a basis to conduct a more precise comparison on the two fields.

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THE IMPACT AND URGENCY OF TEACHING OPPORTUNITY - RECOGNITION TO HIGH SCHOOLS STUDENTS

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ABSTRACT

The coronavirus COVID-19 pandemic is a global health crisis and the greatest challenge the world has faced since World War II. This pandemic, however, represents far more than a health crisis, but also has the potential to inflict crippling social, economic, and political effects that will be felt for decades to come. All nations must now fully realize that the policies of the past will not produce economies benefits in the future. A system for the creation of high growth entreprises (HGEs) is essential, therefore, to drive economic growth and promote job creation. Education must play a key role in this process as entrepreneurs are the key drivers behind the evolution of HGEs. This means entrepreneurship must be taught in all high schools and embraced as a core discpline that will develop an entrepreneurial mindset in younger generations. While it is certain that only a small fraction of the population will become entrepreneurs, there must be the necessary "social electricity" from all parts of the economy to full embrace and promote entrepreneurship. Education must lead the way to creating a new class of entrepreneurs who will create tomorrow's HGEs.

Keywords: *entrepreneurship, uncertainty, entrepreneur training, opportunity recognition, opportunity creation*

1. INTRODUCTION

Joseph Schumpeter in his 1942 work, *Capitalism, Socialism, and Democracy* (*CSD*), describes Creative Destruction as a "process of industrial mutation that incessantly revolutionizes the economic structure from within, incessantly destroying the old one, incessantly creating a new one" (Schumpeter, 1942). Schumpeter argued that Creative Destruction drives a continuous flow of technical opportunities that is fueled by constant disruptions in markets, industries, national economies, and the world economy. At the heart of Schumpeterian Theory is his firm belief that the entrepreneur is the key driver of innovation, the realizer of profitable opportunities, the discoverer of better business combinations, the implementor of more efficient production processes, and the launcher of effective marketing strategies. According to Schumpeter, the competitiveness of a nation relies on the competitiveness of its firms, which depends on the competitiveness of its entrepreneurs. Governments in developed nations predominately agree with Schumpeter and devote significant resources to promoting entrepreneurship (Shane, 2009; Acs, 2016). The European Union itself has devoted significant resources to entrepreneurship by creating the Entrepreneurship Competence Framework or "EntreComp" that is designed to boost the entrepreneurial mindset and activity of European citizens. There is a global public policy debate, however, that questions whether or not government supported entrepreneurship programs actually spawn the kind of startup companies that fuel innovation and create high paying jobs. Those on the other side of the Schumpeterian coin remain skeptical of a strong correlation between absolute entrepreneurship and economic growth and argue that "Encouraging more and more people to start businesses won't enhance economic growth or create a lot of jobs because startup, in general aren't the source of our

economic vitality or job creation" (Shane, 2009). One of the principle reasons for this failure stems from the fact that "when governments intervene to encourage the creation of new businesses, they stimulate more people to to start new companies disproportionately in competitive industries with lower barriers to entry and high rates of failure" (Shane, 2009). While research clearly supports that entrepreneurship drives economic growth, this is only true if the entrepreneurs themselves are able to avoid early exits (Santarelli, 2007). Entrepreneurs commonly make the mistake of choosing industries and markets that offer the easiest entry, yet do not represent the best startup opportunities (Johnson, 2005). The result for most nations is a situation where most of the benefits realized from entrepreneurship programs are derived from a small number of High Growth Enterprises (HGEs), whereas the vast majority of enterprises struggle to survive (Block, 2017). The European Union (EU) fully recognizes the importance of HGEs and "their impact on job creation, industrial renewal and the leverage effect they can have on sectoral productivity or regional competitiveness" (JRC, 2020). According to the 2020 JRC Technical Report on HGEs, they make up 10.7% of the total number of EU enterprises across all sectors. While there is a consensus on the importance of HGEs, its definitions vary according to choices of growth indicators, growth measurements, time dimensions, and the processes through which firms grow (JRC, 2020). The OECD defines HGEs as "enterprises with average annualised growth in the number employees greater than 20% per year, over a three-year period, and with ten or more employees at the beginning of the observation period," (JRC, 2020) while the Eurostat definition specifies that "HGEs are enterprises with at least 10 employees in the beginning of their growth and having average annualised growth in number of employees greater than 10% per annum, over a three year period. (Eurostat, 2016)." As one can see, both definitions define success in terms of the abilities of HGEs to significantly boost employment. It is also notable that HGEs across all EU nations are predominantly younger than average enterprises, proven innovators, and more present in knowledge intensive services than in manufacturing (JRC, 2020). This is consistent with the makeup of HGEs in other developed nations. Based on these statistics, Schumpeter would likely recognize that entrepreneurs in the EU are creating HGEs that are innovating, driving economic growth, and boosting employment. Scott Shane would point out, however, that the HGEs in the EU on average only account for 10.7% of the total number of enterprises and that economic growth and jobs creation is a function of "encouraging high quality, high growth companies to be founded (Shane, 2009)." Overall, both Schumpeter and Shane would both agree that policy makers need to create a pipeline that steadily generates more HGEs year over year as their impact of economic growth and job creation is indisputable. The EU's 2020 Entrepreneurship Action Plan indicates a troubling, long-standing downtrend in entrepreneurial activity where:

"since 2004, the share of people preferring self-employment to being an employee has dropped in 23 out of the 27 EU Member States. While three years ago for 45% of Europeans self-employment was their first choice, now this percentage is down to 37%. By contrast in the USA and China this proportion is much higher: 51% and 56% respectively. Moreover, when new enterprises are founded, they grow more slowly in the EU than in the USA or emerging countries, and fewer of them join the ranks of the world's largest firms" (EU Entrepreneurship Action Plan, 2020).

It clear that the EU and member state policy makers must find ways to boost economic growth and job creation. It is also clear that HGEs are key economic drivers, but they are not created without the support of a dynamic ecosystem. An HGE pipeline, therefore, must be one that extends the right support, education, motivation, and opportunities to those most capable of maximizing its benefits.

2. THE HGE PIPELINE

The flow through an HGE pipeline comes from a diverse set of individuals who identify with one or more of the following groups before becoming entrepreneurs.

2.1. The unemployed

For policy makers, the prospect of turning unemployed individuals into successful entrepreneurs is very attractive. Not only do they become employed, but they create enterprises that employ others. The problem with this reasoning is that unemployed people often suffer from a lower opportunity cost of their time (Shane, 2009). "Desperate entrepreneurship," often involves a situation where an unemployed individual starts a business due to a lack of opportunities in the labor market" (Mühlböck, 2018). Perhaps starting a business is a better option than sitting at home and playing games. This is not an effective way to build a powerful HGE pipeline, yet it is commonly supported by many nations for reasons often more political than economic. The research paper "Does self employment reduce unemployment?" analyzed data from 23 OECD countries and concluded that "the results of this paper unequivocally suggest that public policy to generate jobs and reduce unemployment would be best served by focusing more on innovative and high-growth entrepreneurship than on inducing the unemployed into entering into self-employment" (Audretsch, 2001). As this data shows, incentivizing the unemployed to become self-employed may drive up the number of startups, but ones that significantly contribute to robust economic growth and job creation with be the exceptions rather than norm. As of June 2020, the unemployment rate in the Euro area was 7.8%, up from 7.7% in May (Eurostat, 2020). Policy makers now face the enormous challenge of addressing rising unemployment during a global pandemic that has inflicted serious economic damage. It will be tempting to hope that a portion of the unemployed can quickly be converted successful entrepreneurs. Unfortunately, the data proves otherwise, and nations will need to utilize other sources for their HGE pipelines.

2.2. Leap of faith vs. Hybrid entrepreneurship

Many entrepreneurs develop great ideas, quit their jobs, and start a business. While we hear a lot about the success stories, the reality is that there is a high frequency of new business failure (Shane, 2003). A way to reduce the risk of failure is to keep your day job while developing a business. A broad range of entrepreneurs, including Apple co-founder Steve Wozniak, worked for other firms while building their own (Raffiee, 2014). The significant takeawy for policy makers is the importance of directing support to those who have the best chance to succeed. Shoveling funds indiscriminately to those who want to be entrepreneurs is most likely to result in wasted funds and higher unemployment. In a COVID 19 world, great care needs to be made to ensure that scarce funds are reaching the most capable hands.

2.3. Young People (Under 25 years old, Non-Students)

In June of 2020, there were 2.962 million unemployed people under the age of twenty-five in the EU, of whom 2.360 million were in the euro area (Eurostat, 2020). The youth unemployment rate was 16.8 % in the EU and 17.0 % in the euro area in June, up from 16.2 % and 16.5 % respectively in the previous month. COVID-19 (Eurostat, 2020). A recent research paper forecasts that "The youth unemployment rate will increase to 26%, and the number of young people not in education, employment and training (NEET) will increase from 4.7 to 6.7 million" (Tamasberger, 2020). The EU faces the enormous challenge of addressing rising youth unemployment. Like with older, unemployed individuals, it is not reasonable to think that polices will be able to seamlessly transform the unemployed youth into vibrant entrepreneurs on their way to creating the next HGEs. This is not to say that those under twenty-five years old cannot create HGEs, but rather that the process that requires education and training.

As it was mentioned before, the transition from being unemployed to becoming an entrepreneur is a bumpy road with a low speed limit and requires the right support, mindset, and dedication.

2.4. Active Students (15-25 years of age)

Entrepreneurship education frequently stimulates lively debates as it involves a "rich and diverse pool of collaborative educators—academics, entrepreneurs, consultants, investors, full-time, part- time, academically qualified, and professionally qualified—with a common understanding that entrepreneurship education is important" (Neck, 2011). Despite the fact that entrepreneurship education is widely recognized as being important, in the EU "education does not offer the right foundation for an entrepreneurial career, difficult access to credits and markets, difficulty in transferring businesses, the fear of punitive sanctions in case of failure, and burdensome administrative procedures" (EU Entrepreneurship Action Plan, 2020). The 2020 EU Entrepreneurship Action Plan further explains that "there is a widespread culture that does not recognise or reward entrepreneurial endeavours enough" and that "To make entrepreneurship the growth engine of our economy Europe needs a thorough, far-reaching cultural change (EU Entrepreneurship Action Plan, 2020)." This negative sentiment is in spite of positive data indicating that "Investing in entrepreneurship education is one of the highest return investments Europe can make. Surveys suggest that between 15% and 20% of students who participate in a mini-company programme in secondary school will later start their own company, a figure that is about three to five times that for the general population" (Jenner, 2012). The harsh reality is that far too few high schools and universities in the EU are making investments in entrepreneurship education and this negatively impacts HGE pipelines.

3. THE ICELANDIC SPORT PIPELINE

Iceland, a nation of only 364,000 people, shocked the world when it qualified for the 2018 World Cup Finals. They were the smallest nation to qualify in the 88-year history of the tournament and this left many larger nations, with much deeper pockets, scratching their heads and wondering how Iceland was able to achieve such a remarkable feat. The reason for this achievement is that Iceland has built a sustainable pipeline for success. Like entrepreneurship, merely participating in a sport does guarantee an elite status. It can be said, however, that Iceland's incredibly high sports participation rate, where 80% of sixth graders play in organized leagues, has taken on a "pedagogical role for children and adolescents as a gateway into society" (Þórlindsson, 1994). Icelandic football creates "social electricity" that galvanizes entire communities and creates collective energy (Durkheim, 1965). Despite its tiny population, Iceland harnesses this communal energy to motivate people at all stages of their sport pipeline. This creates a sense of identity and an atmosphere that "transports enthusiasm, increases individual well-being, unites citizens and enhances their level of communication and collective sentiments – as is common in religion" (Birrell, 1981; Durkheim, 1965). This sense of identity runs seamlessly through their pipeline, from young kids playing for the first time, to the parents, to the high schools, to the universities, to the elite few that were able to represent Iceland in the World Cup in 2018 cheered by fans doing the famous "thunder clap." The Icelandic Sport Pipeline is the opposite of what we see in EU entrepreneurship. Despite the existence of comprehensive frameworks and action plans, member states herd entrepreneurs into disproportionately in competitive industries with lower barriers to entry and high rates of failure" (Shane, 2009). As we have discussed, the addition of more entrepreneurs can actually make an economy worse, not better. Please recall that the 2020 EU Entrepreneurship Action Plan specifically stated that "To make entrepreneurship the growth engine of our economy Europe needs a thorough, far-reaching cultural change." This cultural change, however, requires "social electricity," which means that the perception of entrepreneurship must change from one of ambivalence to one of inclusion (Figure 1).

Teaching entrepreneurship is now taking on even greater importance as "Researchers increasingly recognize that entrepreneurship may offer a significant part of the solution to poverty around the world" (Alvarez, 2015; Bruton, 2013). While the connections between entrepreneurship, economic growth, and poverty reduction require a lot more research and validation, it has been reported that "In general, the faster and more widespread economic growth in recent decades has enabled large numbers of people to move out of poverty such that extreme poverty has fallen to less than ten percent of world population" (Si, 2018). According to a World Bank June 2020 Global Economic Prospects report, "when compared with pre-crisis forecasts, COVID-19 could push 71 million people into extreme poverty in 2020 under the baseline scenario and 100 million under the downside scenario." This problem cannot be addressed by repackaging policies of the past. How can the EU create an HGE pipeline driven by "social electricity" that can boost economic growth, create jobs, and potentially lower poverty? The first step is to teach opportunity recognition.

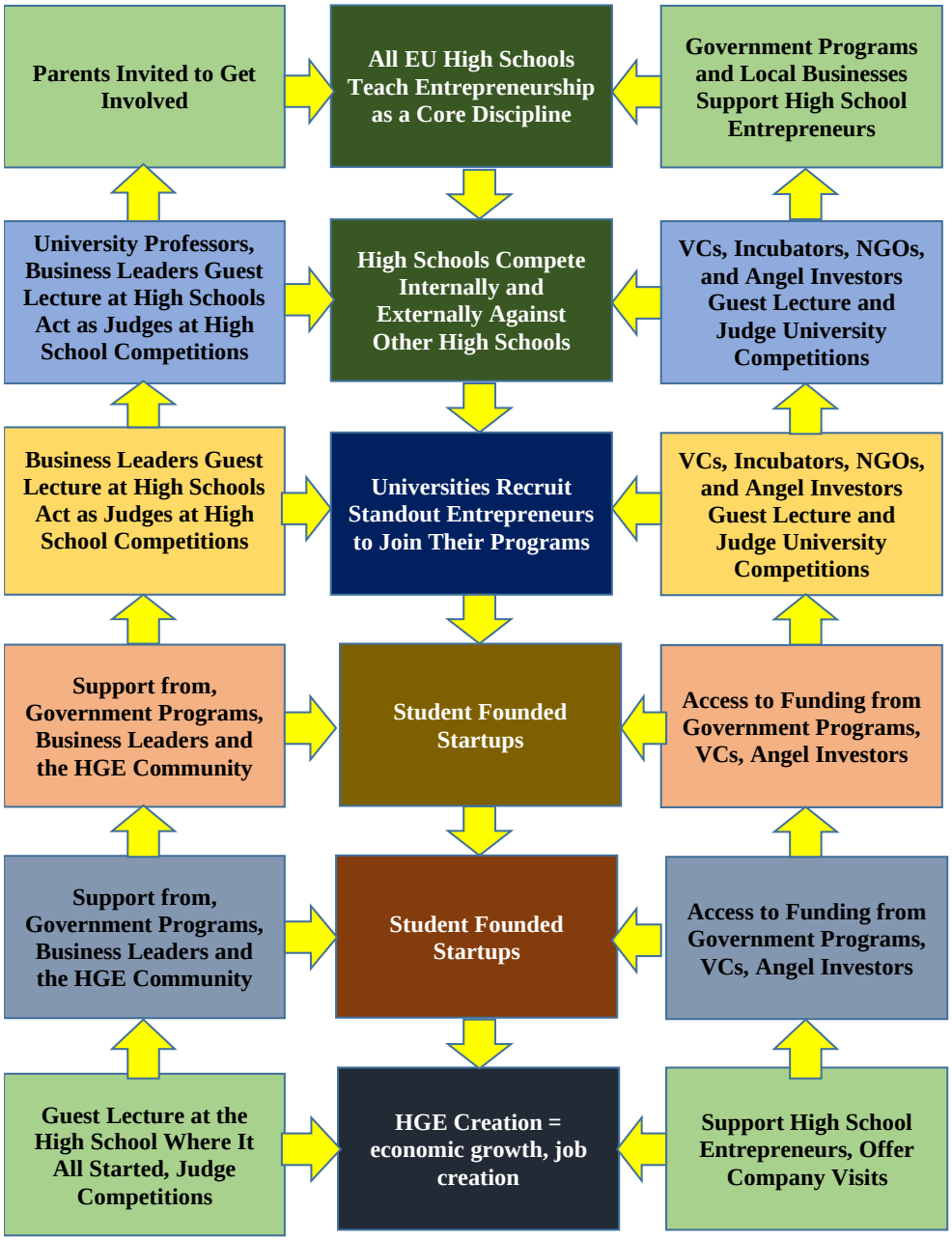

Figure 1: EU HGE pipeline with social electricity

4. THE JOURNEY BEGINS WITH OPPORTUNITY RECOGNITION

Entrepreneurship can be defined the study of opportunities (Shane, 2000) and entrepreneurial opportunities can be defined as "situations in which new goods, services, raw materials, markets and organizing methods can be introduced through the formation of new means, ends, or means-ends relationships (Casson, 1982; Shane, 2000). Over the past two decades, there has also been a debate regarding how opportunities are created. The Discovery Theory argues that the existence of market imperfections, such as technological changes, political and regulatory changes, social and demographical changes, and global pandemics that disrupt the competitive equilibrium (Shane, 2003). These disruptions, therefore, create opportunities to launch new products and services. This theory, however, relies on the fact that opportunities to produce new goods and services emanate from industries and markets that already exist (Kirzner, 1973). It furthers states that entrepreneurs take on a more passive role and only become activated when there is an opportunity to be exploited (Shane, 2003). As the name suggests, the Discovery Theory means that entrepreneurs are endlessly scanning the environment and searching for opportunities as if they are panning for gold. The famous economist, Israel Kirzner, reasoned that the key distinction between entrepreneurs and non-entrepreneurs is "entrepreneurial alertness" (Kirzner, 1973). It is this alertness that enables certain individuals to dissect causal relationships, to harness the power of Big Data, to comprehend economic and social processes, to challenge the status quo, and to think counterintuitively (Gaglio, 2001; Shane, 2003). The Creation Theory, therefore, requires an active entrepreneur since opportunities are not created from pre-existing industries or markets. In other words, "entrepreneurship is not about "climbing mountains", but rather, about "building mountains of opportunities that are recognized, only after they have been exploited" (Alvarez, 2006). While search for opportunities plays a leading role in the Discovery Theory, the role of search does not hold a significant place in Creation Theory. The logic here is that entrepreneurs act when they see an opportunity, but have little ability to anticipate whether or not one is about to be created. Given the level of uncertainty in our current world, this is more true than ever before. The distinction between Discovery Theory and Creation Theory is very consequential for entrepreneurship education. While opportunities arise from information asymmetry, not everyone in society can see recognize these opportunities. It is a select few that is able to recognize particular opportunity at a particular time (Kirzner, 1973). While Entrepreneurship education will not transform every student into the next Jeff Bezos or Elon Musk, it will help all students to not only better recognize opportunities, but to also develop the problem solving and critical thinking skills that are useful in nearly every occupation. After teaching entrepreneurship to both high school and university for many years, I have realized that I overestimated their ability to recognize opportunities. This is not a poor reflection on these students, but rather the understanding that opportunity recognition, like playing a sport or the piano, takes repetition and practice. This is why we devoted an entire high school semester to opportunity recognition. By doing this, we wanted to answer the key question "Can opportunity recognition be taught?" If yes, then "How can we measure its effect on high school and does it justify having entrepreneurship as a core high school discipline?" These questions are of critical importance given the pressing need of EU nations to create High Growth Enterprises.

5. THE LEAN LEARN CHALLENGE

5.1. Lean learn challenge (February 2020)

As a part of the Lean Learn Academy, began teaching the Lean Learn Program (LLP) at the Bornemisza Péter High School (BPG) in September of 2019. Classes were conducted in English and were held every Wednesday from 15:00 –17:00 in the school gymnasium. The focus of the Fall 2019 semester was on opportunity recognition, which was mainly facilitated by group work.

Guest speakers were frequently brought in to not only speak, but to run activities based on their own business challenges. The program was run inspired by the Creation Theory rather than the Discovery Theory. In February of 2020, we convinced some of the entrepreneurship class to take the LLP Challenge in order to individually assess their progress. One week before the LLP Challenge, each student was given the opportunity to ask their family, friends, neighbors, and all other interested parties about what business opportunities they were observing and what they thought were the most promising. In teaching opportunity recognition, it is critical that students learn how to recognize and utilize the resources available to them. The LLP Challenge was given in the high school computer lab where each student had a maximum of two hours to complete the challenge. Use of the Internet was allowed, but not the use of live messaging or email.

The LLP Challenge:

1) Describe your brainstorming and ideation process during the past week. While there are lots of problems that needs to be solved, how did you choose the one that offers the best opportunity?
2) Lay out your vision for a Minimum Viable Product (MVP) as the solution to this problem and discuss what features you chose to include and not include. Be as visual as possible.
3) How will you create your MVP at a minimal cost?
4) How will you test the MVP?
5) Validated learning involves the constant testing of an MVP using the "Build, Measure, Learn" process. What is your plan to maximize the amount of interactions between your MVP and potential customers?
6) How will you define success and what are your milestones?
7) Why is NOW a great time to start this business?

5.2. The adult LLP test

In order to understand the level of opportunity recognition of the BPG students, we wanted to see how adults of various ages and backgrounds would perform on the same test under similar conditions. The first attempt to administer Adult LLP Challenges in early March was unsuccessful. The failure was a function of the global pandemic and also a poor test format. Starting in June of 2020, we created a Five Day Sprint that allowed each registered adult to take an opportunity recognition and minimum viable product (MVP) crash course in order to clarify, inspire, and motive them to take the same LLP Challenge the BPG students took in February. This format has proven to be far more successful and better received than just an email with the chalneg questions. We have run eight sprints this summer and have been slowly collecting tests from a wide variety of individuals with diverse backgrounds (Table 1). More tests are coming constantly coming in and will continuously be added to our research.

Table following on the next page

Age	Country	Occupation	Entrepreneurship Course (Y/N)	Started a Business (Y/N)
53	NZ	Director at Metro Safety UK	N	Y
49	Hungary	Albermarle, Hungary	Y	Y
33	Russia	Executive MBA Corvinus, Trading Director at Normeston Trading SA	N	Y
32	Hungary	Customer Success Director Gravity R&D	Y	Y
47	NZ	Global Procurement Ricoh	N	N
28	Romania	Customer Service Operations Supervisor Exxon	N	N
22	USA	Yale Business School	Y	N
21	Hungary	Corvinus University Student	Y	N
54	Australia	Construction Director at Whitestar	N	Y
49	NZ	Self Employed Real Estate	N	Y

Table 1: Adult Participant Background Data

5.3. LLP evaluation

A LLP evaluation guide was created to make the scoring criteria clear for evaluators. The evaluation involves the following three main areas:

5.3.1. Opportunity Recognition (Table 2)

This section is worth 40% of the total score or 40 points and covers the following key areas:

- **Total addressable market**: Does the individual's target market(s) represent a signifiant and sustainable revenue opportunity? (1-10 points)
- **Beatable competition**: Are there reasonable barriers to entry for this target market(s)? (1-10 points)
- **Growth:** Is the individual's business scalable and displays the clear opportunity to grow and keep growing? (1-10 points)
- **Decision Making**: Does the individual make effective and strategic decisions regarding selecting the right problem and business opportunity? (1-10 points)

5.3.2. Building the Mnimum Viable Product (MVP)

This section is worth 40% of the total score or 40 points and covers the following key areas:

- **Viable Solution**: Does the individual's MVP represent a viable and cost-effective solution for their identified opportunity? (1-10 points)
- **Testing the MVP:** Does the individual describe how they will test their MVP and receive valuable feedback? (1-10 points)
- **Success and Milestones:** Does the individual define success and outline key milestones? (1-10 points)
- **Why Now?:** Timing is critical. Does the individual explain why now is a great time to start their business? (1-10 points)

5.3.3. Creativity

This section is worth 20% of the total score or 20 points and covers the following key areas:

- Variety of ideas and contexts (1-5 points)
- Variety of sources (1-5 points)
- Combining ideas (1-5 points)
- Communicating something new (1-5 points)

1	2	3	4	5	6	7	8	9	10
The individual **does not** identify a legitimate problem and **fails** to recognize an attractive business opportunity. The business opportunity presented **fails** on all points from the above criteria. There is **no** evidence of any real research.		The individual **identifies** a legitimate problem but **fails** to demonstrate why it is an attractive business opportunity. The business opportunity presented **fails** on most points from the above criteria. There is **little** evidence of any real research.		The individual **identifies** a legitimate problem and **somewhat** demonstrates why it is an attractive business opportunity. The business opportunity presented **does** match some of the above criteria. There is **some** evidence of some research done.		The individual **clearly** identifies a legitimate problem that represents a **good** business opportunity according to the criteria shown above. There is **evidence** of research done from a variety of different sources.		The individual displays an **exceptional** identification of a legitimate problem that represents a **strong** business opportunity according to the criteria shown above. There is **strong evidence** of comprehensive research done from a variety of different sources.	

Table 2: Opportunity Recognition Evaluation Rubric

5.3.4. LLP challenge evaluators

All of the challenges received from high school students and adults were randomly mixed and made anonymous. Two independent evaluators were chosen and they scored all of the challenges according the previously specified criteria. An Rwg analysis was run to determine the subject matter interrater agreement. This analysis did indicate significant variance on certain individuals, while showing strong strong correlation amongst others. The strongest correlation was found in the Opportunity Recognition evaluation, which is the focal point of this paper. The Creativity evaluation showed the most variance and ws therefore not used in the final analysis. The addition of more independent evaluators, a larger sample size, the removal of outliers are steps that can significantly improve the quality of this research.

6. THE LEAN LEARN CHALLENGE RESULTS

We took the average of the two evaluator's scores and then used them to rank all of the participants in the following categories. It should also be noted that were an equal number of boys and girls participating in our program.

6.1. Average Scores of BPG Students vs. Adults for Opportunity Recognition

We took the average score from the evaluators and then used these scores to create an overall average. Our analysis found the following scores:

- BPG Students: **30.6**
- Adults: **29.5**

The overall score of the BPG students turned out to be higher than that of the adults who all completed the five day sprint. We take this to be a positive indicator that the semester of opportunity recognition training significantly improved the level of the BPG students to approximately an adult level.

6.2. Average Scores of BPG Students vs. Adults for MVPs

Our analysis found the following scores:

- BPG Students: **25.375**
- Adults: **27.45**

The scores were again close between the two groups with the adults having the slight edge.

6.3. Average Scores of BPG Students vs. Adults for Opportunity Recognition + MVPs

Our analysis found the following scores:

- BPG Students: **56.5**
- Adults: **55**

We were pleased to see the BPG students scored slightly better than the adults further indicating that the impact of opportunity recognition training at the high school level can have a significant impact on high school students.

6.4. Improving the research results

Further ways to improve the research will be to give the challenge to high school students who have not taken the opportunity training course and to more high school students who have. Adding more adults of various backgrounds will benefit the research, along with the tesing of university students before and after opportunity recognition training.

7. CONCLUSION

In its July 25th, 2020 edition, The Economist wrote that "The pandemic has also exposed and accentuated inequities in the economic system. Those in white-collar jobs can work from home, but "essential" workers—the delivery drivers, the rubbish cleaners—must continue to work, and are therefore at greater risk of contracting covid-19, all the while for poor pay. Those in industries such as hospitality (disproportionately young, female and with black or brown skin) have borne the brunt of job losses" (Economist, July 2020). This level of market disequilibrium requires the help of entrepreneurs who are ready to build mountains rather than just climb them. Nations are searching for answers regarding how to create HGE pipelines to drive the economic growth and job creation that their people are demanding. The problem is that the policies of the past are being applied to a world that has changed dramatically just this year. The greatest wealth of any nation is its future generations. Entrepreneurship education does not seek to turn every student into an entrepreneur, but rather to help younger generations to become better prepared to live in a world that is more like to become more uncertain than certain. The results of our research are a first step towards providing definite proof that entrepreneurship does have an impact and should be taught in all high school out of necessity rather than as an accommodation. Igniting the "social electricity" around entrepreneurship in Europe could do wonders for its future. There is a very real urgency to do so.

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THE MODERATING EFFECT OF FIRMS' CASH HOLDING ON THE RELATION BETWEEN CASH CONVERSION CYCLE AND FIRM PERFORMANCE

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ABSTRACT
While different studies found contradicting results on the relation between firm's cash conversion cycle (CCC) and firm's profitability, our previous work on a sample of 255 companies (in 16 countries) in the European Automotive Industry during the period 2009-2018 found an inverted (U) shape relation between the two variables. Moreover, we found that this relation is moderated by firms' access to external credit both at the country and firm levels. In the previous work, we used firm size as a determinant of the firm's access to external credit. In this study we extend our analysis and test the moderated effect of firm's internal financial constraints on the relationship between firm's performance and firm's CCC. We gathered firm-level financial information from the Amadeus Database and information about the countries growth in GDPPC from the World Bank database. The final sample includes the financial information of 745 firms in 24 countries in the European Automotive Industry during the period 2010-2019. To test our hypotheses we use unbalanced panel data models with firm-level clustered errors. The results confirm our first hypothesis that the relation between firms' CCC and firm profitability takes an inverted (U) shape. The results also confirm our second hypothesis that the relation between the firm's CCC and firm's performance is moderated by the firm's internal financial constraints measured by the firm's cash holding. Specifically, we found that less internally financially constrained firms can increase their profitability by increasing their CCC to its optimal level. Our results may help practitioners on the way of managing CCC to improve their firms' performance.
Keywords: *cash conversion cycle (CCC), firm profitability, cash holdings*

1. INTRODUCTION

This study uses the firm's cash conversion cycle (CCC) as a measure of firm efficiency in managing its supply chain operations (Tsai, 2011; Wang, 2019). The CCC expresses the difference in time needed for the company to receive the money from selling its products and the time needed for the firm to pay its obligations. The CCC is calculated as the average days started from the day of purchasing the inventory and selling it as final products, plus the average days started from the day of selling the products on credit until the day of receiving the money from their customers, minus the average days needed to pay their obligations to their suppliers. As prior studies found mixed results on the relation between the firm's CCC and its performance, this study is trying to investigate this relation and also expand prior work in testing the moderated effect of other factors on this relation. This paper complements our prior work testing other factors that may moderate the relation between the firm's CCC and its profitability, therefore, we test if this relation depends on the level of firm's access to internal credit. To measure the firm's internal financial constraints, we use the cash holding to total capital ratio as a proxy for the firm's access to internal credit. We assume that firms with more access to internal credit can increase their profitability by increasing the CCC comparing with firms with less

access to internal credit. To investigate the hypotheses, we accessed firms' financial information from Amadeus database and we use the data about countries' growth in GDPPC from the World Bank Database to control for the difference in development among countries. The final sample contains (5,827) firm-year information for (745) firms working in the automotive industry from (24) European countries from 2010- 2019. Findings confirm the hypotheses. In this study, we found that the relationship between a firm's CCC and its profitability takes an inverted (U) shape. Moreover, the results support our second hypothesis, suggesting that the firm's access to internal credit moderate the relation between a firm's CCC and its performance. Specifically, we found that the optimal level of CCC for companies with a higher level of cash holdings is higher than the optimal level for companies with lower level of cash holdings. Our study may help practitioners to have a broader vision about the relationship between CCC and performance, which may help them to make better managerial decisions regarding their CCC and cash management. Moreover, our study provides a proposal for future studies to investigate other factors that affect the relationship between CCC and firm performance.

2. LITERATURE REVIEW AND HYPOTHESES DEVELOPMENT

2.1. Cash conversion cycle and firm profitability

The Cash Conversion Cycle (CCC) is equal to the average days the inventory stays in the firm plus the days it takes for the company to collect its accounts receivable minus the days it takes the firm to pay its accounts payable (Özbayrak and Akgün, 2006). Therefore, the cash conversion cycle refers to the time it takes for the company to receive the cash from its sales minus the time it takes the company to pay for its purchases (Wang, 2019). Previous studies examining the relationship between a firm's CCC and its performance found conflicting results, and these different findings could be a result of differentiation in the factors that each studies implements in its analysis. Several studies found a negative relation between firm's CCC and its performance (Zhang et al, 2019; Chang, 2018; Zeidan and Shapir 2017; Ukaegbu, 2014; De Almeida and Jr., 2014; Ebben and Johnson, 2011; Wang, 2002; Enqvist et al, 2014; Randall and Farris, 2009; Garcia-Teruel and Martínez-Solano, 2007), others found a positive relation (Bigelli and Sánchez-Vidal 2012; Gill et al, 2010). Moreover, other studies found no relation between CCC and firm performance (Kroes and Manikas, 2014; Deloof, 2003), or found a non-linear relation (Wetzel and Hofmann, 2019; Mun and Jang, 2015; Baños-Caballero et al, 2014). In the studies that found an inverted (U) shape relationship between firm's CCC and its performance, these findings mean that increasing the firm's CCC could result in increasing the firms' sales by increasing their inventory to prevent interruption in their operations (Chang, 2018), or increasing the level of sales with credit (Kieschnick et al., 2013), which will result in increasing their profitability. Moreover, increasing the CCC by decreasing the level of accounts payable means the firm is trying to keep a constant relation with supply chain partners, or getting discounts to pay their obligations earlier (Ng et al., 1999), which also resulted in increasing their profitability. Increasing the CCC could result in improving the firm's performance but until an optimal level (Wetzel and Hofmann, 2019; Mun and Jang, 2015; Baños-Caballero et al, 2014), whereas increasing the CCC beyond this point could result in increasing the cash flow risk for the firm. In this study, we expect to find an optimal level of CCC that is necessary to increase firm performance. According to this expectation, a firm with a low level of CCC can increase its profitability by increasing its CCC until the optimal point, therefore our first hypothesis is:

- **H1**: the relation between firms' CCC and profitability follows an inverted (U) shape.

2.2. The moderating effect of firms' cash holding on the relationship between cash conversion cycle and firms' profitability

According to Kaplan and Zingales (1997), the precise and broad definition of financially constrained firms are firms that face a wedge between the internal and external costs of funds. According to this definition, almost all firms are classified as financially constrained, therefore, the authors considered the firm as more financially constrained when the difference between the external and internal costs increases. Another definition of firm's financial constraints refers to whether a firm has not enough funds to finance its potential investment in the right time (Han and Qiu, 2007), therefore, it is expected that firms with a high level of cash holding to be less financially constrained (Kaplan and Zingales, 1997). Our previous study investigated the moderated effect of firm access to external credit outside its supply chain on the relationship between the CCC level and its performance, while in this study we expand the previous analysis by using a different firm-level proxy for firm's internal financial constraint to test if the level of firm's internal funding moderates this relationship. The indicator of firms' financial constraints in this study is the cash holding ratio. The cash holding receive more interest in academic research after the financial crisis when the credit from financial institutions collapsed dramatically (Nguyen and Qian, 2014), which increased the cash flow risk and motivated firms to increase their level of cash holding. Previous studies found that the level of cash holding depends on different factors such as the firm's access to external credit (Fazzari et al, 1988), the cash flow risk of the firm (Marwick et al., 2020; Bates et al, 2009; Han and Qiu, 2007; Opler et al., 1999) and the change in working capital of the firm (Bates et al, 2009). Therefore, we expect to find the effect of the firm's CCC on its performance to depend on the level of its cash holdings. Our proposition is motivated by the work of Mun and Jang (2015) who found an effect of the firm's cash level on the relation between the firm's working capital management and firms' performance. Moreover, Bigellia and Sánchez-Vidal (2012) found that firms with longer CCC tend to have a higher level of cash holdings, and Kieschnick et al., (2013) found that managing the firm's operating working capital depends on its financial constraints. In this study, we expect that the CCC is likely to be more important for the firm's performance when it is more internally financially constrained comparing to less financially constrained firms. Financially constrained firms are expected to rely more on the financing from their supply chain partners based on the long-relation with them, which resulted in decreasing the asymmetric information risk. On the other hand, prior studies found the firms access to trade credit to be positively affected by their level of cash holdings (e.g., Kling et al, 2014). Therefore, we expect that the relationship between a firm's CCC and its performance to be moderated by its financing constraints. More specifically, we expect that the optimal level of CCC for financially constrained firms to be lower than for less financially constrained firms who have more internal credit and can provide more credit to their customers (Ng et al., 1999), therefore, they will be more profitable when increasing their CCC level. Based on that, we propose the following hypotheses:

- **H2:** Increasing the firm's internal financing measured by the firm's cash holding will increase the optimal level of firm's CCC.

3. RESEARCH METHOD

3.1. Data

We used the data about firms' financial information from Amadeus database and we control for the difference between firms according to their countries by using the growth rate of countries GDPPC from the World Bank Database. The final sample includes (5,827) firm-year observations from (24) European countries in Automotive Industry over the 2010- 2019 period.

3.2. Model specification and variables

We use unbalanced panel data regressions with firm, industry, and year fixed effects and firm-level clustered standard errors. We use the following two econometric models to test the hypothesis:

$$ROA_{i,t} = \beta_0 + \beta_1 CCC_{i,t} + \beta_2 CCC_{i,t}^2 + \sum Control\ Variables + \sum Fixed\text{-}effects + e_{i,t} \quad [1]$$

$$ROA_{i,t} = \beta_0 + \beta_1 CCC_{i,t} + \beta_2 CCC_{i,t}^2 + \beta_3\, Firm\ C\&CE/TC_{i,t} + \beta_4 CCC_{i,t} * Firm\ C\&CE/TC_{i,t} + \beta_2 CCC_{i,t}^2 * Firm\ C\&CE/TC_{i,t} + \sum Control\ Variables + \sum Fixed\text{-}effects + e_{i,t} \quad [2]$$

In the first model (1) we test the relation between firms' CCC and firm's profitability, whereas in the second model (2) we test if the relationship between the firm's CCC and firm's profitability is affected by the level of firm's internal financial constraints. The dependent variable in our models is the firm profitability (ROA), it is calculated as net income divided by total assets. The main independent variable is the firm's CCC and it is measured as the account receivable days outstanding plus inventory days outstanding minus account payable days outstanding. To test the level of firm's internal financial constraints we use cash holding to total capital ratio (C&CE/TC). This ratio is calculated as cash and cash equivalent divided by total capital. In our models, we control for different variables expected to affect firm performance according to previous studies. As our sample contains firms working in different countries, we control for differences in countries' development using the growth of Gross Domestic Product Per Capita (GDPPC) (Ukaegbu, 2014; Mun and Jang, 2015). At the firm level we control for the firm's size (Manikas and Patel, 2016; Mun and Jang, 2015; Ukaegbu, 2014; Kroes and Manikas, 2014) measured by the natural logarithm of total assets, firm's current ratio (e.g., Detthamrong et al, 2017; Enqvist et al, 2014) calculated as current assets divided by current liabilities and the leverage ratio (TL/TA) (e.g., Wang, 2019; Chang, 2018; He et al, 2017; Mun and Jang, 2015; García-Teruel and Martínez-Solano, 2007) calculated as total liabilities divided by total assets. Moreover, as we are dealing with panel data from different firms and industries over a time series, we use the fixed effects at the firm, industry, and firm level. In our models, we also include firm-level clustered standard errors to avoid the correlation between firm's variables observations over time. Finally, to overcome the problems that could result from outlier observations, we winsorized all variables at 1 and 99 percent.

4. RESULTS

4.1. Summary of statistics

The statistics of our variables are summarized in the table (1). The results found that the average return on assets of our sample is (4.51) with a minimum value of (-32.96) and a maximum value of (30.43). The level of firm's CCC fluctuates between (-71) days and (193) days with an average of (37.26) days. The minimum level of the variable cash holding to total capital ratio is (0) and the maximum level of the ration is (2.44) while the average level of this ratio is (0.19).

Table following on the next page

Table 1: Summary of Statistics

Variable	*N*	*Mean*	*S.D.*	*Min.*	*25th*	*Median*	*75th*	*Max.*
ROA	5827	4.51	9.27	-32.96	0.5	4.26	9.3	30.43
CCC	5827	37.26	44.74	-71	9	33	59	193
C&CE/TC	5827	0.19	0.38	0	0.01	0.05	0.198	2.44
Current Ratio	5827	1.6	1.43	0.24	0.92	1.26	1.78	11.61
TL/TA	5827	0.64	0.21	0.13	0.5	0.66	0.79	1.39
LN Total Assets	5827	11.63	1.27	8.9	10.84	11.42	12.15	16.63
Growth GDPPC	5827	1.19	2.67	-5.71	0.06	1.57	2.75	5.87

Table 1 presents number of observations (N), mean (Mean), standard deviation (S.D.), minimum (Min.), 25th percentile (25th), Median (Median), 75th percentile (25th), and maximum (max.) of the variables used in the empirical models. For each firm-year observation, the variables in the table are defined in the following way. ROA is the return on assets. CCC refers to the cash conversion cycle. Firm Size is measured as the natural logarithm of total assets. C&CE/TC is the ratio of cash and cash equivalents divided by total capital. Current ratio is computed by dividing current assets by current liabilities. Leverage ratio is calculated as total liabilities divided by total assets. Growth GDPPC is calculated as the percent change between the GDP per capita of the country in which the company is located country in time t and t-1.

The correlations between variables are presented in table (2). The results indicate that the relationship between the firm's performance and its CCC is negative which is consistent with several previous studies (Zhang et al, 2019; Chang, 2018; Zeidan and Shapir 2017; Ukaegbu, 2014; De Almeida and Jr., 2014; Ebben and Johnson, 2011; Wang, 2002; Enqvist et al, 2014; Randall and Farris, 2009; Garcia-Teruel and Martínez-Solano, 2007). The results indicate that the moderator variable (cash holding to total capital) is moderately correlated with the control variables LN Total Assets and TL/TA. Based on these figures, we don't expect to have the problem of multicollinearity in our models.

Table 2: Correlation Matrix

	Variable	1	2	3	4	5	6	7
1	*ROA*	1						
2	*CCC*	-0.0260*	1					
3	*C&CE/TC*	-0.0567*	-0.1230*	1				
4	*Current Ratio*	0.1585*	0.2578*	-0.0223	1			
5	*LN Total Assets*	-0.0832*	-0.1023*	-0.0285*	-0.0052	1		
6	*Growth GDPPC*	0.2107*	-0.0717*	0.0021	-0.0073	0.0218	1	
7	*TL/TA*	-0.3835*	-0.1623*	0.2449*	-0.4811*	-0.012	-0.0901*	1

Table 2 presents Pearson's pairwise correlations between the variables used in the empirical models.

4.2. Empirical results

The results of the econometric models are provided in table (3). The model (1) test the effects of moderator and control variables on the firm's performance. The results found no direct effect of the firm's cash holding level on its performance. On the other hand, the results show a significant effect (at 1% and 5% p-value) for all the control variables on the firm's profitability. The effect of firm size and the growth in GDPPC on the firm profitability are positive whereas the effects of both, the current ratio and the total liabilities to total assets, are negative.

Table following on the next page

Table 3: Results of Main Analysis

Variables	Model 1 DV: *profitability*	Model 2 DV: *profitability*	Model 3 DV: *profitability*
CCC		-0.004	-0.010
		(0.595)	(0.229)
CCC^2		-0.00017***	-0.000128***
		(0.000)	(0.011)
C&CE/TC	-0.0812546	-0.050	0.134
	(0.886)	(0.930)	(0.825)
CCC x C&CE/TC			0.024*
			(0.063)
CCC^2 x C&CE/TC			-0.000271***
			(0.004)
Current Ratio	-0.4867727***	-0.252	-0.258
	(0.005)	(0.181)	(0.168)
LN Total Assets	1.028185**	0.703	0.683
	(0.045)	(0.170)	(0.181)
TL/TA	-22.06749***	-22.656***	-22.687***
	(0.000)	(0.000)	(0.000)
Growth GDPPC	0.2365907**	0.245***	0.246***
	(0.009)	(0.007)	(0.006)
Year Fixed-Effects	Yes	Yes	Yes
Industry-Fixed Effects	Yes	Yes	Yes
Firm-Fixed Effects	Yes	Yes	Yes
Constant	4.50225	9.394	9.664*
	(0.450)	(0.109)	(0.098)
Observations	5,893	5,827	5,827
Adjusted R^2	0.1661	0.180	0.181
No Firms	745	745	745

*Table 3 presents the results of multivariate panel regressions with firm, industry, and year fixed effects and firm-level clustered standard errors. Each model shows coefficients and p-value (below). ***, ** and * indicate statistical significance at the 1%, 5% and 10% level, respectively.*

Figure following on the next page

Figure 1: Graphical Empirical Results

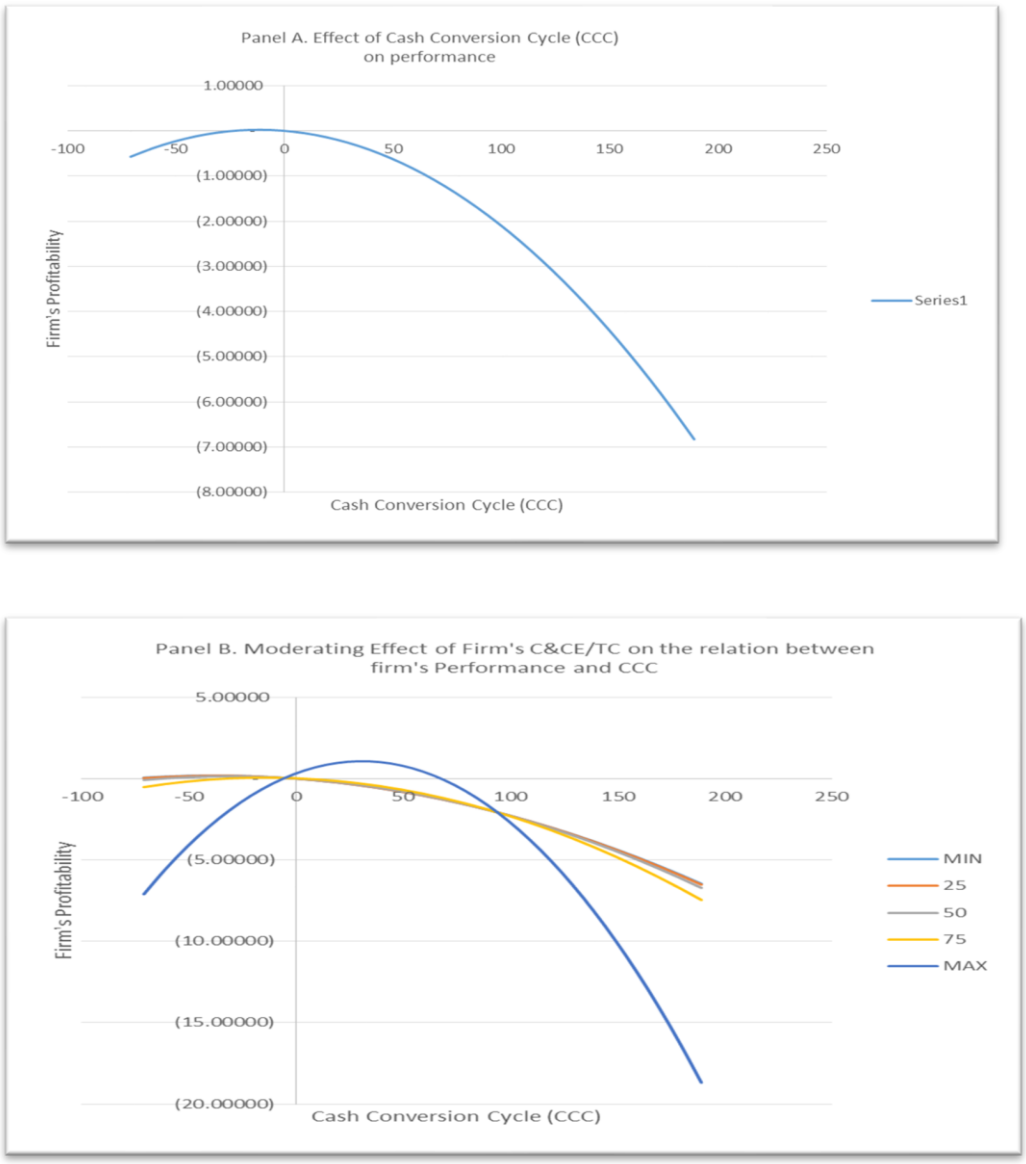

Figure 1 shows the graphical representation of our empirical results. Panel A shows the inverted (U) shape relation between the firm's CCC and firm's profitability which is consistent with our first hypothesis. Panel B shows that the relation between the firm's CCC and firm's profitability is moderated by the firm's cash holding.

From table (3), the results of the model (2) indicate that the relationship between the firm's CCC and firm's profitability is nonlinear which is consistent with previous studies (Wetzel and Hofmann, 2019; Mun and Jang, 2015; Baños-Caballero et al, 2014). Specifically, we find a significant negative relation between the quadratic CCC and firm profitability. This result supports our first hypothesis. Panel A of figure (1) indicates that for our sample, the optimal level of CCC is around (-11) days. We use the model (3) to test if the relationship between the firm's CCC and its profitability is moderated by the firm's internal financial constraints measured by the level of cash holding within the company. The results confirm our second hypothesis that the relationship between the firm's CCC and its performance is moderated by the firm's cash holding level.

From panel (B) of figure (1), it is clear that the firms with a higher level of cash holding can increase their profitability by increasing their level of CCC until an optimal level which is higher than the optimal level for firms with a lower level of cash holding. We found that the optimal level of CCC for firms with a higher level of cash holding is around (29) days whereas the optimal level of the CCC for firms with a lower level of cash holding is approximately (-41) days.

5. CONCLUSIONS

The empirical tests found an inverted (U) shape relationship between the firm's CCC and its performance measured by the firm's profitability. Based on this finding, the firms can increase their profitability by increasing the level of their CCC until the optimal level. However, it is expected to find factors that affect this relation. In this study, we test if the relationship between firm profitability and its CCC level is moderated by the level of cash holding in the firm. The logic behind this expectation is that firms try to shorten their CCC to get their money back as fast as possible, so they can invest it again in their operations. Therefore, increasing the level of cash holding means that they can depend on the cash to support their operations while increasing their CCC to increase their profitability. The findings confirm our second hypothesis that the relation between the firm's performance and its CCC depends on the level of the firm's cash holdings, which is consistent with some prior studies (e.g., Bigellia and Sánchez-Vidal, 2012). Concretely, we found that the optimal level of CCC for firms with a higher level of cash holdings is higher than the optimal level of CCC for firms with a lower level of cash holdings. To conclude, this research provides the managers with a new method of measuring and managing the level of CCC of their firms while taking into consideration other factors influencing the way of managing the CCC level and its potential effects on firm performance. This work as any other work has some limitations. First, while this study contains a sample of firms from different European countries, the study focus on the automotive industry, therefore, future studies could check the robustness of our findings in different industries. Second, this study uses the firm's cash holding level as a measure of firms' internal financial constraints. Future studies can test the effect of other proxies of internal and external financial constraints on the relationship between CCC and firm performance.

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ESSENTIAL CHARACTERISTICS OF LEAD-USERS RELATED TO MEDICAL INSTRUMENTS INNOVATIONS

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ABSTRACT
The availability of creative ideas is a necessary but insufficient condition for the successful innovation process. Despite the talented lead user's ideas, the success rate of the innovation process and the level of effectiveness are varying and most of the cases remain low during the entire co-creation process. We have realised that the characteristics of lead-users have a significant impact on the average quality of the entire co-creation and innovation process. The study determinates essential characteristics of lead-users as traits, qualities, features which unambiguously classify them to user-innovators and primarily important for co-creation. In order to gain user's experience during the co-creation lead users need to be expert in their domain, own tacit knowledge, have a high number and complex cognitive patterns, highly educated and have technical expertise. We have found that the five-stage model of knowledge acquisition created by Dreyfus & Dreyfus (1986) strongly corresponds to the lead-user identification in the experience space defined by Prahalad & Ramaswamy (2003).
Keywords: *co-creation, experience space, expert level experience, medical instruments lead-users*

1. INTRODUCTION

Crowd contests usually aggregate a large number of contributors and generate a high number of submissions (Füller, Hutter, Hautz, & Matzler, 2016). Asking for ideas related a human health Google received more than 154.000 submissions, and they assigned 3000 internal workers to the evaluation process (Füller, Hutter, & Hautz, 2013). We have recognised during our initial research the existence of multiple reliable solutions for efficient idea selection. The availability of creative ideas is a necessary but insufficient condition for the successful innovation process. There is an increasingly significant role of open innovation, co-creation, lead-users and user-innovators. We have performed experiments in a high-tech embedded hardware and software developer company. We have found that despite the talented lead user's ideas, the success rate of the innovation process and the level of effectiveness are varying and most of the cases remain low during the entire co-creation process. We have realised that the characteristics of lead-users have a significant impact on the average quality of the entire co-creation and innovation process. The result of the observation forced us to change our interest in the analysis of lead-user's characteristics. Different market segments require different characteristics. As little attention has been received in academic literature to the characteristics of lead users during the co- creation process related to medical innovations, our interest turned to the health-care instruments innovations and the investigation is performed on the medical domain. The study determinates essential characteristics as traits, qualities, features which unambiguously classify user-innovators and primarily important for co-creation. We have found a link between a major characteristic (expert level of user innovator) and a five-stage

model of knowledge acquisition. This model is described in the research design part. The next section provides a literature review and develops the research gap.

2. LITERATURE REVIEW

2.1. Open innovation

Firms are recently increasing their activities to engage user innovators to get fresh ideas and set up collaboration (Bayus, 2013; Dahlander & Piezunka, 2014). Open innovation and crowdsourcing are widely used to access user-innovators and utilize their knowledge, skills and solutions (Majchrzak & Malhotra, 2013). Users become active members in the innovation process of a corporation and participate in new product development (Piller, Ihl, & Vossen, 2011). They are identified and named as lead-users which have everyday user experience with a novel process or product concept of interest. Open innovation has become a new imperative for organising innovation. The innovation process combines internal and external ideas, inflow and outflow of knowledge to improve the entire innovation success (Bogers, Chesbrough, & Moedas, 2017).

2.2. Adaptors and innovators

According to Burkemper, Sarooghi, & Libaers (2014) creativity and innovations are the two major activities of an innovation process. Creativity is the generation of novel and innovative ideas (Amabile, Conti, Coon, Lazenby, & Herron, 1996), while innovation is the implementation of these ideas (Rosing, Frese, & Bausch, 2011). The link is not straightforward as the correlation is less than one between creativity and innovation. It is explained by the fact that the implementation of creative ideas into innovations consist of two different and even opposite processes (Rosing, Frese, & Bausch, 2011). This statement is corresponding to Kirton's adaptive-Innovation theory (Kirton, 1976) which identify tools to distinguish individuals based on the cognitive style of creativity (idea generation) and problem-solving (implementation). Kirton describes adaptors (creative individuals) as people who prefer to "do things better" and innovators (problem solvers) who prefer to "do things differently" (Stum, 2009).

2.3. Lead users and user innovators

Studies apply lead-users and user-innovators as identical expressions. Hippel (1986, p. 796) identifies lead-users based on their two main characteristics: "lead-users face needs that will be general in a marketplace - but face them months or years before the bulk of that marketplace encounters them and lead-users are positioned to benefit significantly by obtaining a solution to those needs". In the same article, Hippel stated that lead users are familiar with future conditions and are in the position to provide exact data on the needs related to such future attributes. Researchers define further characteristics of lead users as a demonstration of stronger opinion leadership and high level of control (Schreier & Prügl, 2008). According to (Brem & Bilgram, 2015) lead-user's creative skills can be identified based on their behaviour. Pongtanalert & Ogawa (2015) define information disclosure and community membership of user-innovators as two significant characteristics related to commercial success. User-innovators tend to reveal or share their innovations with suppliers or other users or even their competitors. According to Gürkan (2014), only a limited number of users provide valuable contributions to the innovation process.

2.4. Technical expertise

Specialized knowledge resources drive competitive advantages for the firm during the innovation process especially in the case of user co-creation (Sandeep, Manju, & Atreyi, 2020).

Hippel, Ogawa, & Jong (2013 p. 31) stated that user-innovators are "significantly more likely than the average citizen to be highly educated, to have a technical education and to be male". Afuah & Tucci (2012) express that problem solvers (use the same terminology for user-innovator as Kirton (1976), are 1. expert of their area (possess accumulated tacit knowledge for complex problem solving and can evaluate different alternatives), 2. develop routines for problem-solving, 3. know cognitive frames (cognitive patterns), 4. possess absorptive capacity (skills for knowledge acquisition). The level of education, accumulated knowledge and expertise in the specific field qualify them to co-creation in high quality (Füller, Hutter, Hautz, & Matzler, 2016). The same study describes furthermore how the characteristics of professionalism play a significant role and influence the quality of contribution related to a Swarowsky design contest. It confirmes professionalism as essential characteristics which have a positive impact on the average quality of the submitted designs. Professionalism as a significant element of the person's characteristics is strongly positively related to the quality of the submission (Füller, Hutter, Hautz, & Matzler, 2016). Hippel (1986) presents previous experiments in his study which confirms that the user's prior experience (familiarity with product attributes and uses) determinates the ability to generate or evaluate novel product possibilities.

2.5. Level of knowledge acquisition

Dreyfus & Dreyfus (1980) created a model of knowledge acquisition which can be applied to identify the different knowledge and experience levels of users. The original idea was further adjusted which lead to the five-stage model of knowledge acquisition from novice to expert. The novice uses formalised and general rules, the expert act intuitively. Dreyfus & Dreyfus (1986) stated that an individual usually passes through the five different stages of perceptions of his activity of own skills improvement. The user will be an expert of a certain type of problems in his area of skills. Not all individuals can achieve the highest expert level. Only a very small portion of beginners can ever master their field. (Mérő, 1990) states two major differences among the levels of the five-stage model. First is the number of the cognitive patterns (schemata) the individual knows and secondly the complexity of their patterns. Based on the above academic statements we assume that lead-users have one of the highest levels of knowledge acquisition and they are expert of their domain.

2.6. Innovation disclosure

Researchers highlight the relevance of engaging lead users in the co-creation activities as idea generation, design, refinement and testing of new concept and products (Prahalad & Ramaswamy, 2003). Stock, Hippel and Gillert (2016) stated that personalities are significantly associated with the failure or success of the innovation process. Successful ideation needs the trait of openness to experience. Successful prototyping demands introversion and conscientiousness. Studies show that user-innovators and product developers have a different mindset (Lackner, 2013) and characteristics (Füller, Hutter, Hautz, & Matzler, 2016). Lead users and product developers are usually different in terms of personality traits (Stock, Hippel & Gillert, 2016) and a variety of emotions (Brinks, 2019). They have different cognitive factors, motivations and work policies which influence the success of the innovation process. According to Pongtanalert & Ogawa (2015) innovation disclosure is essential characteristics of a user-innovator. In the medical field, Hienerth & Lettl (2011) stated that surgeons disclosed their new surgery method at a medical conference which become later a worldwide standard by adapting other surgeons. Pongtanalert & Ogawa (2015) classified user-innovators into three categories: revealing innovators, social innovators and silent innovators. The research found that only the revealing- and social innovators are willing to share their innovations. Hippel (1986) states that a subset of users should have a real understanding of the need to share their solution to a new

product, process or service with inquiring market researchers. We identify the willingness of innovation disclosure as an essential characteristic in a co-creation process.

2.7. Willingness to co-create

It is crucial for companies to open their boundaries to engage user innovators and cooperate along the entire innovation process. In case of an innovative idea, lead users have creative ideas about the solutions but generally unable to develop the embedded hardware, software solutions, build up the complete device, have it certified by their own. They need to interact with a team of product developers of a firm for product development, certification, production and market evaluation. According to More (1970, p.55) "professionals apply very general principles, standardised knowledge, to concrete problems requiring solution or palliative measures". Birdsong (2008) states that standardised knowledge defines the difference between professionals (developers) and non-professionals (users). Professional developers produce most realisable solutions, while user-innovators apply more divergent thinking style, produce more original and valuable new ideas. Individuals with a high level of professionalism might be too narrow-minded and restricted in their thoughts regarding feasibility and realisation (Füller, Hutter, Hautz, & Matzler, 2016), whereas users are more able to think outside the box. In the medical industry, Gürkan (2014) find that the high level of expected benefit, intrinsic motivation, the frequent use of information differentiate the most lead users from the non-innovative ordinary users in the medical area. The different mindset between users and developers during the entire co-creation process can lead to either a successful or an unsatisfactory innovation. The innovative idea itself does not determine the success of the innovation process if there is a lack of willingness for contribution. The willingness of lead-users plays an essential role, despite of the differences between users and developers. According to the paragraph "Technical expertise" lead-users are Afuah & Tucci (2012) expert of their area (possess accumulated tacit knowledge for complex problem solving and can evaluate different alternatives), 2. develop routines for problem-solving, 3. know cognitive frames (cognitive patterns), 4. own absorptive capacity (skills for knowledge acquisition). The level of education, accumulated knowledge and expertise in the specific field qualify them to co-creation in high quality (Füller, Hutter, Hautz, & Matzler, 2016). User-innovators are "significantly more likely…highly educated, have a technical education and to be male" (Hippel, Ogawa, & Jong, 2013 p. 31). We have found that the five-stage model of knowledge acquisition created by Dreyfus & Dreyfus (1986) strongly corresponds to the different levels of userness (typical user, lead-user and user-innovator). Despite the extensive literature review on the evidence of the strong link between the described models, lack of research has been found which investigate the correspondence between them. We have identified it as a research gap.

3. RESEARCH DESIGN

3.1. Approach

According to Basarab (2014) disciplinary research concerns one and the same level of reality. Transdisciplinary concern the dynamics of several levels of reality. It is necessary to pass through the disciplinary knowledge in order to discover of these dynamics. Our research performed under the considerations of transdisciplinary because of its goal to understand the reality, which cannot be fulfilled in the framework of disciplinary research. We use different disciplines to address a common problem and move beyond discipline-specific approaches. Each user has their level of reality which is confirmed by Hippel (1986) statement as each users' insights into new product needs and possible solutions are constrained by their own reality and real-world experience. The study is performed under the interpretivist research philosophy as it aims to create new understandings and interpretations of an existing link between the expert level of knowledge acquisition and lead-users in context of co-creation and related to medical

instruments innovation. We use the abductive approach in our research because of the clear deduction, and induction reasoning is not appropriate for theory generation and existing theory modification. We apply the qualitative methodology in order to conduct semi-structured interviews to compare the participant's responses to identify the underpinning reality. We conduct descriptive research which fit well to gain accurate research aim. Reliability and validity principles are consistently applied to proof of data quality.

3.2. Research framework

Based on the literature reviews we identified essential characteristics of lead users. According to this research we have classified users into three categories. The first level of users are the typical users with everyday life experience. According to Hippel (1986) typical (non-innovative), users are strongly blocked useing a product in a novel way as they use the product in a familiar way. Furthermore, Hippel (1986) stated that lead users problem-solving approaches are different from typical users as they employ them in a novel way. We use the two main characteristics defined by Hippel (1986, p. 796) for lead-users to identify the lead-users on a second level as 1. they encounter the customer and market needs months or years before, 2. and have ideas about the technical solutions. The third level consists of further essential characteristics which are described in the literature review: community membership, technical expertise, level of knowledge acquisition, innovation disclosure and willingness to co-create. Lead users on the third level have the highest level of knowledge acquisition as described in the "Technical expertise" part of the literature review. These essential characteristics distinguish them from lead-users and classify them to user-innovators. The research framework is applied for single individual lead-users and not for a team of lead-users.

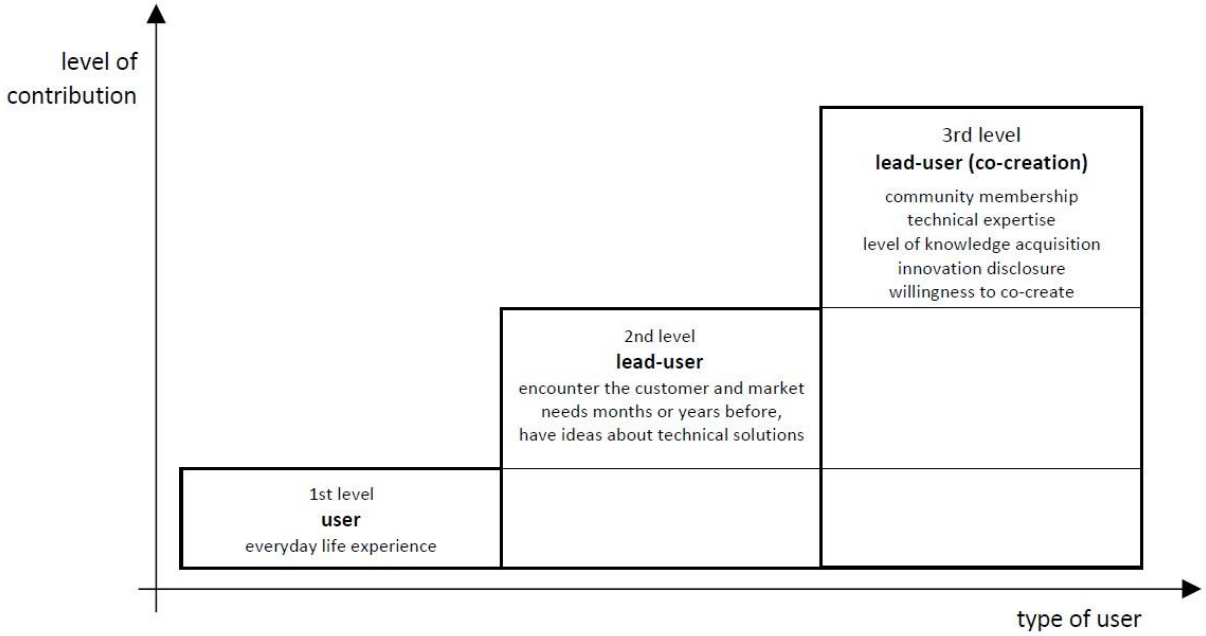

Figure 1: Classification of users based on their level of contribution in a co-creation process

Hippel (1986) focuses on lead user's perceptions and preferences in order to provide new product concepts, insights and design data for novel products, processes and services. The study states that lead-users are the leading edge of market trends in terms of new product and process needs and who expect a high benefit of these solutions triggered by the needs. Prahalad & Ramaswamy (2003) changed the focus away from products and services into experience environments to create value in an active co-creation process for individual customers.

The value is gained from the user's unique own consumer experiences through an interaction with the company. They state that while creating product variety is easy but the real value has to be created with users and innovation must be concentrated on their co-creation experiences. The same user could identify different values at different context with a different experience. User experience innovation intends to enable the co-creation and not to improve products or services. The "personalized, evolvable experiences are the goal" (Prahalad & Ramaswamy, 2003 p. 10).

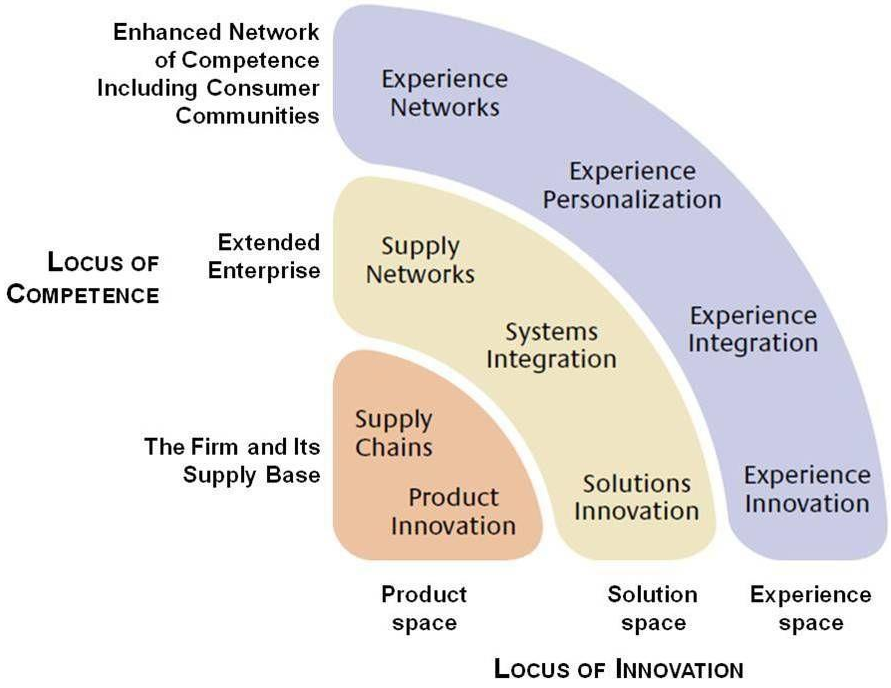

Figure 2: Different levels of innovation (Source: Prahalad & Ramaswamy, 2003)

Recent studies confirm that the „evolvable experiences" (Prahalad & Ramaswamy, 2003 p. 10) can be provided by users who are expert in their domain, own tacit knowledge and have routines for complex problem solving, have domain-related cognitive patters and absorptive capacity for further knowledge acquisition (Afuah & Tucci, 2012). Education, accumulated knowledge, expertise in a dedicated domain are crucial for co-creation (Füller, Hutter, Hautz, & Matzler, 2016). The user have a technical education, highly educated and (Hippel, Ogawa, & Jong, 2013 p. 31). Professionalism plays an important role in co-creation (Füller, Hutter, Hautz, & Matzler, 2016). Hippel (1986) presents that user's prior experience (familiarity with product attributes and uses) determinates the ability to generate or evaluate novel product possibilities. We have found that the five-stage model of knowledge acquisition created by Dreyfus & Dreyfus (1986) is highly corresponding to the evaluation of lead-userness and identify the user who provides evolvable experiences and therefore create value in the active co-creation process. The five-stage model of knowledge acquisition is a model of how an individual (in the recent case user) acquire skills through formal instructions and practising.

Figure following on the next page

Skill level → Mental function ↓	Novice	Advanced Beginner	Competence	Proficient	Expert
Recollection	Non-Situational	Situational	Situational	Situational	Situational
Recognition	Decomposed	Decomposed	Holistic	Holistic	Holistic
Decision	Analytical	Analytical	Analytical	Intuitive	Intuitive
Awareness	Monitoring	Monitoring	Monitoring	Monitoring	Absorbed
	typical users			lead-users	

Figure 3: Five-stage model of knowledge acquisition with the corresponding user categories (Source: Dreyfus & Dreyfus, 1986)

The Novice uses formalised and general rules and features which is relevant to the skill. The Novice wants to do a good job but missing any coherent sense and his performance is judged by how well he followed the learned rules (Dreyfus & Dreyfus, 1986). The performance is judged by the acquired application rules from the user manual of the product. Advanced Beginner learns not by rules but by experience through practical activities. A student nurse can distinguish by the learnt experience of the breathing sounds that suggesting oedema from those that indicate pneumonia. Competence has more experience, the number of recognized situational elements (cognitive patterns) is increasing. The nurse will assess the urgency of the patient needs and will not go automatically from patient to patient (Dreyfus & Dreyfus, 1986). The number of cognitive patterns are increased but still limited and mainly stored in a short term memory. The level from novice to competence can be identical to the user with everyday knowledge and life experiences. The Proficiency have sufficient knowledge and expertise to do his task as the performer has experience about similar situations (patterns) from the past. The number of cognitive patterns at this level in case of a doctor becomes over 60.000 and these patterns are stored in the long term memory. On the expert level, the users have enough experience about the product or services and store the highest number of the cognitive patterns in the long term memory. Experts can not always give a rational explanation of their intuition (know-how and intuition can be used as synonymous) but generally, they turn out to be correct (Dreyfus & Dreyfus, 1986).

4. CONCLUSION

Based on our research we have understood better the problem of co-creation with different knowledge and experience levels of users. We have found that some essential characteristics of lead-users have a significant impact on the average quality of the entire co-creation and innovation process. Only a limited number of lead users are able to provide such primary important features and contribution to the innovation process. We have classified users based on their level of contribution to the commercial success. We stated that the focus innovation has been changed from products and services to experience environments to create value in an active co-creation process to share evolvable experiences. In order to gain this experience during the co-creation innovation lead users need to be expert in their domain, own tacit knowledge, have a high number and complex cognitive patterns, highly educated and have technical expertise. We find that the highest levels of the five-stage model created by Dreyfus & Dreyfus (1986) are corresponding to the requirements of lead users in the experience space described by Prahalad & Ramaswamy (2003).

5. LIMITATIONS

The investigation is made on the individual level in case of a single individual. The social and organisational levels are not investigated. The study does not consider the fact that an accurately composed team may contain different lead-users which members may not be suitable

separately. This assumption can lead to further investigation related to the composition of a prosperous team, which includes all the crucial characteristics. An additional considerations can be involved in further studies as different stages of the innovation process require different skills and abilities. Our aim is to conduct a survey in a real environment in the health-care domain related to medical instruments innovations. Further research can be performed on social and organisation levels and also on different market fields.

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UNDERSTANDING POSITIVE ORGANISATIONAL CHANGE THROUGH SOCIAL CONSTRUCT OF PSYCHOLOGICAL SAFETY: AN INTRAPERSONAL LEVEL PERSPECTIVE

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ABSTRACT

The postmodern perspective views an organisation as open complex system that changes and develops through emergent interdependent collaborations between its members. This brings into focus members' ability of to communicate openly and effectively and raises need for a fertile environment that encourages voice-behaviour, promotes learning, boosts innovation and experimentation. The aim of this study is to explore the nature of psychological safety with its underpinning theories and schools of thoughts, with particular attention to psychodynamic approach to understanding psychology of leadership. We will look closely at personal-level predispositions for creating and perceiving psychological safety in a leader-member exchange. An additional objective is to determine if psychological safety influences followers hope, efficacy, resilience, optimism.

Keywords: *psychological safety, leadership, individual perceptions, psychological capital*

Human organisations are an open book and their stories are constantly being co-authored. Pasts, presents, and futures are endless sources of learning, inspiration, and interpretations. We have a choice about what we study and what we study changes organisations.
David Cooperrider

1. INTRODUCTION

To understand why and to what extend a single member's story plays a role in organizational change and development, one must consider changes that occurred over the last 300 years in viewing an organization in its entirety. In the latest postmodern perspective an organization is seen, metaphorically speaking, as a living socially-constructed human system in which we all participate (Lewis et al., 2008); an ever-changing space that enables human sense-making in a work context (Weick, 1979). There is no definitive history of any organisation. All history is composed of stories we tell each other to make sense of our experience of the world (Cantore, Cooperrider, 2013). An organisation no longer positions itself as a separate entity ("Grand Narrative), dominated by order and authoritative "top-down" approach to change, but rather as "people organizing together in continually changing patterns of relationships and realities". In this light, organizational knowledge, problems and organizational change is likely to be seen as a co-creation of its members through their stories, experiences, immediate perceptions, feelings and beliefs. Organisational scientists and change theorists are looking at organisations through the lens of transdisciplinarity and drawing inspiration from systems theory, complexity and chaos theories, and psychology among others. The systems theory suggests an open systems perspective, explaining that in order to survive a system needs to be responsive and actively interact with its external environment. The main tenet of complexity theory movement, the complex adaptive system, when applied to organisational-change theory interprets organisation as something emerging from the relationships of its members rather than being determined by the choice of individuals (Stacey et al., 2000). Both complexity theory and chaos theory encompass characteristics of a new world that features rich interconnectivity, ambiguity, chaos and rapid change. In this vocabulary, organisations are described as highly complex, nonlinear feedback systems due to the human factor that shapes them.

The attributes of chaos that organisational change theorists most exploit are those of "orderly disorder" and "self-organising" nature. Margaret Wheatley (2006) explained this self-organising concept as "mess upon mess until something workable emerges". The application of this set of theories leads to a new envisioning of an organisation as dynamic collaboration, occurring in continuously shifting configurations, where each individual member's story, "here-and-now" perceptions and beliefs shape the organisational change. These configurations, a web of highly interdependent teams who need to communicate across boundaries to make sense of their common reality (projects, goals), is a typical arrangement of work in the knowledge era. Echoing with reality, research proves that today's employees spend 50% more time in collaboration than they used to do 20 years ago (Cross, Rebele & Grant, 2018). For new type of organisations to develop and grow organically, these collaborations should feature innovate and creative outcomes. Considering the volatile, complex and ambiguous nature of interactions between members inside and outside an organisation, both stability and instability are expected to occur at different points of organisational change processes. An important discovery the scientists have made is that most exceptional creativity arises from instability; it emerges at the edge between chaos and order. As Andersen and King put it in 1990, "creativity is and intra-individual cognitive process, while innovation – inter-individual social process". The intention to innovate and associated attitudes and behaviours are directly related to the thinking styles. For the benefit of organisational change, the members of a team should possess different personality traits and emanate from different backgrounds. It calls for diversity in organisational structure. All innovative and creative activities are associated with experimentation, trial-and-error, risk-taking, and failure, i.e., they strive on "mess." As Tetenbaum et al. put it, "organizations need to acquire a culture in which rules are meant to be broken and assumptions are being constantly tested." Thus, for organisations to stand out and truly thrive its members need to embrace the "fuzziness" of innovation process and the messiness of experimentation with all their dark side concepts. Trial-and-error practice, risk-taking and failure are stressful exercises for human beings. These activities push us outside the levels of familiar, comfortable, and learned automatic behaviours. What enhances the stress is the fact that postmodern organisation is conflictual in its nature; but the very tension that produces conflict also produces genuinely creative fruitful ideas (Tetenbaum and Laurence). Consequently, we are looking at a highly complex organisation in nature and function experiencing continuous change at every level of its existence. We have been persuaded that its members should be highly adaptive and resilient to stress, and fearless in their eagerness to innovate and think creatively. If it makes sense in theory, the reality tells a completely different story. Too often, knowledgeable, skilled, talented people cannot contribute what they know, because they fail to recognise the need for their knowledge at that critical moment on the job. The reality shows that more often people are reluctant to stand out, to speak up in fear to be wrong, or offend a leader or a colleague, or be perceived as negative. Hiring smart, talented individuals is not enough. For knowledge work to flourish, people need an environment where they feel they are able to share their knowledge, they should be able to work together. The very first recognition of the need for psychological safety "to help people cope with the uncertainty and anxiety of organisational change" goes back to the early 1960s. MIT professors Edgar Schein and Warren Bennis in their research on organisational change noted that psychological safety helps people overcome "defensiveness" and "learning anxiety" at work, and allows them to focus on achieving common goals rather than self-protection. In the 1990s Amy Edmondson introduced and tested an idea that psychological safety is a group-level phenomenon. In a group with high levels of psychological safety, people feel comfortable expressing and being themselves, and what is essential today's complex innovation-motivated organisations, people feel safe to speak up, share concerns and mistakes without fear of being punished or embarrassed.

It is reasonable to assume that psychological safety penetrates organisational reality at every point, and to different extent is present during these interactions. Further we will investigate the attributes of psychological safety, study the underpinning theories, and will look into the composing blocks of this group-level phenomena: leadership, group members, personal perceptions and beliefs. We will discuss whose responsibility it is to create psychological safety in a team. What role does leader's personality play in establishing the climate of psychological safety? What role do members' personal experiences, stories and beliefs play in assessing, perceiving, the level of psychological safety in their teams? Finally, we will evaluate how the perception of psychological safety climate affects members' self-efficacy (confidence), hope, optimism and resilience, a.k.a. state-like constructs of psychological capital.

2. THEORETICAL BACKGROUND

2.1. Underpinning theories of psychological safety

In this section we will consider different definitions of psychological safety and reflect on the schools of thoughts to which this factor of organisational science belongs. In "The power of Appreciative Inquiry", Whitney et al. write: "It seems that psychologists like organisational development consultants, have recognised that human systems move in the direction of what they study and that to contribute constructively to human and society well-being we need to develop a vocabulary of joy, hope and health. (Whitney et al. 2010). In the last couple of decades, a huge advancement has been made in the "science and scholarship of the positive", including the development of emotional intelligence (Goleman et al. 2004), advances in appreciative inquiry (Cooperrider et al. 2004), studies of positive emotions in organisations (Fredrickson, 2003), and the science of happiness (Seligman, 2002). All these theories and schools of thought reside under the umbrella of Positive Organisational Scholarship (POS), which focuses on "dynamics in human organisations that lead to developing human strength, producing restoration and resilience, fostering vitality and cultivating extraordinary individuals" (http://www.centerforpos.org). Positive psychology is suggested as part of psychological understanding and practice. Some theorists trace it back to the thoughts of Aristotle, who "believed that there was a unique *daimon* or spirit within each of us; acting in accordance with this daimon leads one to happiness." (Boniwell et al., 2006). Gergen draws attention to the notion held by another philosopher of mind, Descartes: "the more you know about the mind, the more you know about human beings" (Cooperrider et al.). More recent antecedents of positive psychology can be found in the domain of humanistic psychology (its most famous theorist, Abraham Maslow), that concerns itself with human life fullness, including meanings, values, freedom, human potential and self-actualisation. The founding fathers of positive psychology are Martin Seligman and Mihaly Csikszentmihalyi (1990s, early 2000s). Although, almost 10 years before they coined the term "positive psychology", David Cooperrider wrote an integrative review of psychology and human sciences, exploring the role of positive (emotions, language, learning, culture, etc.) as it relates to human systems development. Cooperrider particularly recognises the role of the new positive language that "gives life to human systems", as in "words enable worlds". (Cantore, Cooperrider, 2013). Alongside existing theories, there is still room for game-changing practices and insights. Naming Appreciative Inquiry, which emphasizes a view of human systems as a dialogic and meaning-making system, and is described as "co-operative co-evolutionary search for the best in people, their organisations, and the world around them… it involves the art and practice of asking questions that strengthen a system's capacity to apprehend, anticipate and heighten positive potential" (Cantore, Cooperrider, 2013). The AI theory owns much to social constructivism theory – an approach to human science which replaces the individual with relationships as the locus of knowledge. In the domain of the AI, change is understood as an implicit part of the very first question we ask, as part of things people talk about and think

about, things we discover and learn. The key element of AI is the notion of generativity, or "generative capacity", borrowed from social constructionism. Gergen defines it as "capacity to challenge the guiding assumptions of the culture, to raise fundamental questions regarding contemporary social life, to foster reconsideration of what which is taken for granted and therby furnish new alternatives for social actions". (Gergen, "Towards Generative Theory"). The common ground these schools of thought share is the belief that human beings can and deserve to flourish in organisational contexts (Seligman&Csikszentmihalyi, 2000), focus on how to use strengths to grow new ways of living, talk about the positive, and encourage the development of positive language to co-create organisational change. What we conclude from the above mentioned is that an organisational science is going through its Renaissance, in a way that it is re-discovering the "beauty" of an individual and his voice inside an organisation. The spotlight of attention is now on members abilities to interact with each other with an inclination for positive change.

2.2. Psychological safety

When asked to define "psychological safety", people develop the following statements: psychological safety is:

- *'Ability to be whole self';*
- *'Belonging: are people welcoming and warm, includes diversity, very open place, you can be yourself';*
- *'A place, both physically and mentally, where all individuals feel comfortable being themselves, sharing thoughts and opinions';*
- *'The belief, perception how team members think they are viewed by others in the group';*
- *'Tool belt to tap into when something triggers';*
- *'Emotional safety';*
- *'Where I can feel safe to share my opinion or express my being in a space or environment';*
- *'Vulnerability';*
- *'A place where there's a foundation of respect and value as a human being regardless of differences';*
- *'Feeling welcomed to share thoughts and feelings without fear of judgement or criticism';*
- *'Mechanism to get back to a safe place when something triggers';*
- *'Ability to feel comfortable to vulnerable sharing';*
- *'Safe place to share';*
- *'The freedom to take appropriate risks and be supported if you fail';*
- *'A sense of belonging in a community';*
- *'Understanding there are external and internal safety factors and being able to express yourself comfortably';*
- *'The opposite of the current heightened state where everyone feels attacked'.*

Psychological safety appears in early discussion on organisational change in 1965. Edgar Schein and Warren Bennis argued that psychological safety is essential for making people feel secure and capable of change. In 1993 Schein wrote that psychological safety helps people to overcome learning anxiety and defensiveness, that occurs when they are presented with data that contradict their expectations or hopes. Similarly, in 1990 William Kahn presented the results of quantitative studies showing that psychological safety enables personal engagement at work by affecting individuals' willingness to "employ or express themselves physically, cognitively, and emotionally during performances". Kahn introduced a defining characteristic of psychological safety: when relationships withing the group are characterised by *trust* and *respect* people are more likely to believe they will be given *the benefit of a doubt*.

The devoted researcher of psychological safety and learning in teams, and the author of "Fearless organization", Amy C. Edmondson, defines psychological safety as "the belief that the work environment is safe for interpersonal risks, and risky behaviors, like asking for help or admitting a failure, will not be punitive". The last decade demonstrates the upsurge of interest to the psychological safety. Among most recognisable reasons are:

- *Generational*: Millennials have become the major workforce, who do not recognise hierarchy, expect inclusion in organisational decision-making processes, wired for networking and collaboration, creative and enthusiastic;
- *Globally expanded competition*: innovation and creativity cannot thrive in environment dominated by fear and silence;
- *Societal:* the movements such as #MeToo, #BlackLifeMatters encourages voice behaviours, the call out for bad actors;
- *Anxiety upsurge* (25% of American students are on anti-anxiety medication)
- *School dropouts* (every 26 seconds a student drops out of high school in the US)

In this context, there is a risk of misunderstanding what psychological safety is and what it is not.

Psychological safety does not equal trust:

- As Edmondson explains, trust is a belief that one person has about another, while psychological safety is a belief about a group norm, how group members think they are viewed by others in the group.

Having the psychological safety climate does not meant that everybody is nice and agreeing with each other:

- It is not about "unequivocal praise and unconditional support". On the contrary, it is about candor and willingness to engage in productive conflict, it enables people candidly express their concerns.

Psychological safety is not a personality factor:

- It refers to the work climate, where people with different personalities can openly express their thoughts and ideas regardless personal traits.

Psychological safety is not about lowering performance standards.

	Low Standards	**High Standards**
High Psychological Safety	*Comfort Zone*	*Learning&High Performance Zone*
Low Psychological Safety	*Apathy Zone*	*Anxiety Zone*

Figure 1: How Psychological Safety Relates to Performance Standards (Source: Emy C. Edmondson, "Fearless organization", p. 18)

Another prominent scholar of leadership, innovation, organisational change, and the author of "Four Stages of Psychological Safety", Timothy R. Clark, explains the factor of psychological safety through the four stages of its development.

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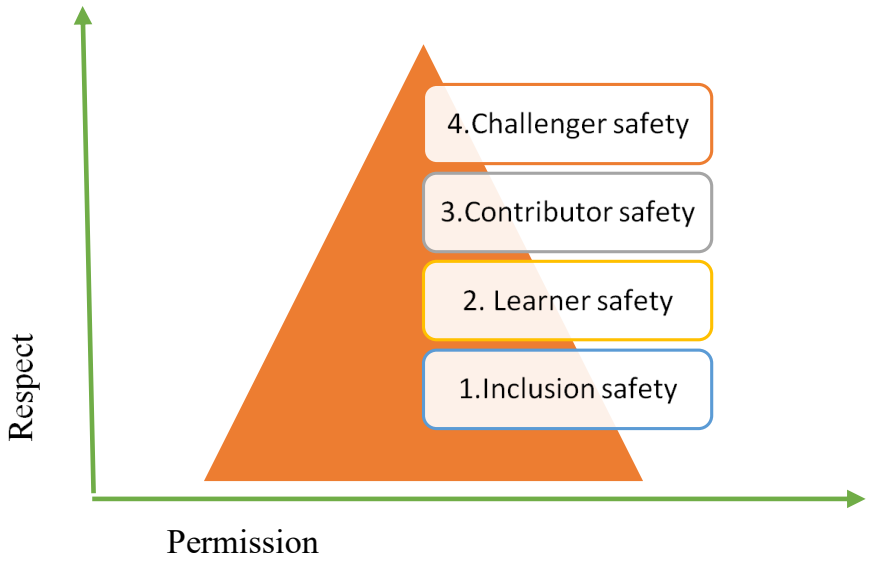

Figure 2: factor of psychological safety through the four stages of its development

According to Clark, psychological safety is a function of respect and permission, and it grows exponentially with the growth of these two parameters.

- *First stage of psychological safety – Inclusion*
  The right to inclusion is not earned, it should not be owned. And yet we, humans tend to govern themselves based on "junk theories of superiority". There are numerous factors of superiority that could be used as an excuse for excluding members: social, physical, intellectual, ethic, gender, ideological, racial, moral, religious, educational, ancestral, etc. These myths of superiority are rooted in the universal condition of the human species insecurity. When applying inclusion in an organisational context, the first step should be about creating a "culturally flat" organisations which welcomes intellectual freedom, which is agnostic to homogenisation and hierarchy when debating issues.

- *Second stage of psychological safety – Learner safety*
  When we learn or try new things, there is a high risk of a failure involved. The higher the risk, the more fearful we are to reveal our vulnerability, to look stupid, unprofessional, to lose face. When vulnerability is punished, learning becomes "expensive" and we turn on the self-censoring mode and eventually disengage. At this stage, it is crucial to disconnect the failure and mistakes from fear.

- *Third stage of psychological safety – Contributor safety*
  At this stage the members feel free and able to contribute as a full member of the team, using their skills and abilities to participate in a value-created process. When encouraged to contribute, when our efforts are accepted, we feel empowered and enthusiastic to make a meaningful contribution. The more we contribute, the more confidence and competence we develop.

- *Fourth stage of psychological safety – Challenger safety*
  Challenger safety provides respect and permission to disagree when we think changes are necessary. It allows us to challenge the status quo without retaliation or the risk of damaging our reputation. As the highest level of psychological safety, it matches the increased vulnerability and personal risk.

2.2.1. Research to date

The existing empirical research confirms the relationships between psychological safety and job engagement, organisational commitment and creative work involvement (Kahn, 1990). More recently Kark and Carmeli (2009) explored the compounds of psychological safety, namely feelings of vitality, which impacts an individual's involvement in creative work. Siemsen et al. (2009) examined the effects of psychological safety on knowledge sharing and argued that the level of confidence in knowledge would moderate this relationship. The growing stream of research examines how psychological safety affects voice behaviours, defined as upward-directed, promotive verbal communication. Liang et al. identified two types of voice behaviours - promotive and prohibitive. Promotive voice is used for expressing how to improve work practices and procedures for the benefit of an organisation (Van Dyne & LePine 1998). Whereas prohibitive voice is necessary for expressing concerns about existing impending practices, incidents or behaviours that may harm an organisation. The researchers established a direct positive effect of psychological safety on voice, pointing out that psychological safety is strongly related to prohibitive voice (Liang et al. (2012). To shed light on employees' lack of voice, Edmondson and Detert (2011) launched a series of studies that tested how implicit theories of voice - specific belief about when and why speaking up is risky - explain significant variance in speaking-up behaviours. Another group of studies at the organizational level of analysis explored the relationships between psychological safety, commitment-based human resources practices, social capital, high-quality relationships, climate for initiative, and firm performance. (Collins & Smith, 2006, Baer & Frese 2003). Carmeli et al. (2007, 2009) focused on psychological safety and learning from failure. Cataldo et al. (2009) examined psychological safety implications for culture change. At the group-level of analysis, the research includes studies of direct, mediating and moderating roles for psychological safety in team learning and knowledge creation, effective communication, innovation, and performance (Edmondson 1996, 1999; Huang et al. 2008; Tucker et al. 2007; Choo et al. 2007; Mu & Gnyawali 2003). We have seen that the biggest obstruction in the growth of psychological safety in teams is fear. It can be fear to be judged, punished, embarrassed; fear of shame, or guilt of accidentally offending another group member. Below we will draw on some basic facts from neurobiology of brain, that will help us throw some light on why fear and likewise reactions make us behave like we do in certain situations.

2.2.2. Neuroscience behind psychological safety

Before proceeding our consideration on how an individual's unique experiences shape his/her perception of psychological safety, we will briefly discuss the commonalities we as species share when it comes to reactions to changes in the environment.

2.2.2.1. Fear, anxiety, aggression

The part of the brain that has been most actively called for witnesses when it comes to explaining the effect of fear on human behaviour is the amygdala. What is less frequently heard, but what considerable evidence implicates is that this part of the brain is also involved in feeling anxiety and generating aggression. Another notable fact about the amygdala is that it is particularly sensitive to ambiguity, or unsettling social circumstances. Being unsure of your place is unsettling (Sapolsky "Behave", 2017). As our basic need, we long to belong, and when we are deprived of this possibility, the anxiety raises and throws us into a defensive mode. In studies exploring the neurobiology of conforming, subjects who stick to their answer when the majority disagrees, also showed amygdala activation. Speaking in layman's terms, it is highly stressful to disagree. Different findings suggest that "amygdala injects implicit distrust and vigilance into social decision making" (Sapolsky, 2017). To paraphrase, we have inborn altruistic behaviours and trust but through negative social experiences we learn the vigilance

and distrust. The unexpected results were shown in another study that confirmed that the amygdala is responsive to positive stimuli when the value of the reward is shifting. As Sapolsky explains that "it is not about the pleasure or experiencing pleasure, it is about the uncertain, unsettled yearning for a potential pleasure, the anxiety and fear and anger that the reward may be smaller than anticipated, or may not even happen." (Sapolsky, "Behave", 2017, p. 40). Thus, uncertainty of change sparks in us both fear and excitement about the unknown future. If guided right and maintained carefully, this could be the fuel that drives our innovative behaviours. The fact that is particularly curious for the framework of our research is that the amygdala helps to mediate both innate and learned fear. It has been confirmed through series of experiments that fear can be engineered, or a false fear can be conditioned. The good news is that this process is reversible. Fear conditioning occurs unconsciously, the "fear extinction" though, requires active learning, it requires awareness. Let us introduce another important "player". The frontal cortex is the part of the brain that separates us from other apes, it is more complexly wired and the last one to fully mature. Among its multiple functions, there is working memory, strategic knowledge organisation and decision-making, gratification postponement, long-term planning, regulation of emotion, and reining in impulsivity (J. Dalley et al. 2011). A remarkable fact for leaders dealing with multi-generational workforce - the frontal cortex gets "fully online" only when people reach their midtwenties (Sapolsky, "Behave", 2017). Not only the frontal cortex is responsible for cognitive functioning, this part of the brain processes social situations and plays the central role in social behaviour. The more socially active we are, the more developed our frontal cortex becomes. Being altogether a paragon of rationale and control in the brain, the prefrontal cortex contains, among multiple others, two regions that are important for our discussion and that influence our decision making – the cognition and emotion. And these two regions constantly interact and work in a collaborative relationship. The amygdala is a reactive initial response, while the frontal cortex stops to analyse the situation and do the "harder right thing". Finally, the frontal cortex mediates fear extinction. The experiment that perfectly demonstrates this exhibits a situation when a subject in a game with two other people is made believe that she is left out. Social isolation activates the subject's amygdala and other brain regions that help process physical pain (periaqueductal gray) and an anatomical picture of anger, anxiety, pain, disgust, sadness (insula). After the subject turns on rational thinking – "This is just a stupid game; I have friends; my dog loves me" – the amygdala et al. quiet down. (Sapolsky, "Behave", p. 59). Can we regulate emotion through thought then? If yes, what strategies are effiecient? According to James Gross, who researched this topic, "antecedent" strategies work better than "response"-focused. This knowledge is at the core of cognitive behavioural therapy (CBT), which provides the tools to reappraise circumstances that evoke anxiety. Gross has shown that using these tools for treating social anxiety, one can successfully reappraise his/her beliefs (Sapolsky, 2017). Harvard psychologist Daniel Wegner has explained the affect of stress on human behaviour in his book "How to think, say or do precisely the worst thing on any occasion". The main takeaway is that during stress, distraction, or heavy cognitive load we lose control over two streams of information processing – the first one, labels an act as being *very important*, and second one, decides whether or not to do it.

2.2.2.2. Stress, or famous fight-or-flight response

A "stressor" is anything that disrupts homeostatic balance. When facing a critical event, our brain activates the stress response. The basic "fight-or-fligh" response is ancient physiology, found in mammals, birds, fish and reptiles. But what is not ancient, Sapolsky notices, is that in "smart, socially sophisticated, recently evolved primates", a stressor expands beyond a physical challenge to homeostasis (Sapolsky, "Behave", p. 126). We have developed an anticipatory stress response. As a result, if one is constantly but incorrectly convinced that he/she is about to lose balance, one becomes an anxious, neurotic, paranoid, or hostile primate who is

psychologically stressed. Activating the stress response too often, too long leads to multiple health issues, suppresses immunity. Interestingly, there exists stress that we humans love – the stress that is mild and transient and occurs in a benevolent context (a ride on a roller-coaster). Sapolsky calls this "optimal amount of stress" being engaged and challenged, playing, being stimulated. "The core of psychological stress is loss of control and predictability. But in benevolent settings we happily relinquish control and predictability to be challenged by the unexpected," – argues the author. Applied in an organisational change context and the topic at hand, this "benevolent settings" that help us tolerate unpredictability and lack of control, is psychological safety climate. Stress makes it easier to learn a fear association and makes it harder to unlearn a conditioned fear association. Stress compromises our working memory, impairs our ability to shift attention between tasks, makes us perseverative (running on automatic mode, being habitual). During sustained stress we are more fearful, our risk assessing skills are low, we are more prone to rapid, reactive aggression. Another remarkable fact is called "stress-induced displacement aggression", if put simply means that lashing out at your colleague, family member or anyone nearby, when in distress reduces your own stress levels. Other studies show that stress also makes us more biased towards selfishness. Jeffrey Mogil, 2006, also proved that stress decreases empathy towards "strangers". It may not come as surprise, that male and female response to stress are different. Shelley Taylor framed the female stress response as being more about "tend and befriend". The fact that speaks for diversity in the workplace. The main takeaway from this segment is that stress can disrupt cognition, impulse control, emotional regulation, decision making, empathy and prosociality (Sapolsky, "Behave", p. 134). Going back to our discussion of organisations, we conclude that stressed, fear-stricken team members will not be capable of creative, innovative work and any healthy productive collaboration unless they operate in a benevolent environment, feel psychologically safe.

3. PSYCHOLOGICAL SAFETY AND HUMAN FACE OF LEADERSHIP

It feels safe to declare that psychological safety is everybody's responsibility, and yet there is no denying that stewardship of psychological safety in a team is in leader's hands. Ethical, authentic, inclusive leaders have been rated as the most effective in the process of developing and maintaining of psychological safety climate through promotion of voice behaviours. Unfortunately, this type of leadership is still rare. It was a regular day of teleworking when David called Jeannine, the team assistant, for a word of advice. It has been a year since David joined their small legal team, the human resources justice unit of an international organisation. From the beginning David earned a reputation of a respectful and diplomatic communicator, attentive listener and a helpful colleague. Normally, David didn't give an impression of someone who would lose his temper or get carried away by emotions, but Jeannine knew something was wrong this time. Turned out that David forgot to send out an email in due time. Neither his mistake would lead to major consequences, nor was David unable to fix it, but he was terrified to bring the news to the team supervisors. Jeannine, who joined the team half a year before David, was familiar with the feeling. She had already experienced first-hand the inconsistency of their team leads' reactions to erring, intimidating, mostly tell-mode communication, lack of guidance and clarity in work tasks combined with splashes of optimism. "I have never doubted my professionalism before! Now I am second-guessing my every move in a fear to make a mistake, and then it happens anyway. It's so unlike me!" – David said. Joined by another colleague, the three of them spent an hour sharing their experiences, encouraging and supporting each other. The sad and fundamental truth about this and suchlike scenarios is that even when team members are aware of the problem the odds are, they will stay reticent. On the surface the work flow runs uninterrupted, the team members and supervisors would exchange niceties, but what remains unspoken is the need for a pep-talk from a support group

every time you need to ask a question, raise an issue, suggest a change in the work process, or bring light to an error. It is utterly invisible when someone is holding back, when someone has but chooses not to share an idea, when someone is aware of a failure but doesn't share, when someone doesn't ask for help. What is even more disturbing is that the environment where people are overwhelmed by fear, eventually makes them question their professional skills and abilities, compromises confidence, plants self-doubt. Let us consider another situation. To evaluate the success rate of their unit John proposed to run a customer satisfaction questionnaire. Having learned by then that new ideas do not fly in this team, the other team members remained silent, leaving their peer's initiative unsupported. The unit leader opened up a twenty-minute monologue on how unnecessary this practice was, how he already knew everything "his" customers might want to say or raise concerns about, closing it with: "And by the way, what do you think?", "Don't apologise for proposing an idea, but do not expect me to sugar-coat my responses". It doesn't take much effort to guess the employee's response: a rear human would want to argue with his supervisor even having solid supporting arguments, and when the "battle" seems already lost. Or would he? Even if confident enough to engage in what could be described as a conflictual situation, how much confidence, or better resilience, will it take to do it every time when a similar situation emerges? Both these case studies show leader's lack of self-awareness, and inability to recognise the damaging effects of their reactive responses to making and admitting mistakes, shutting down motivation to share new thoughts, creating an environment of compliance and disengagement. The results of the "4 Stages of Psychological Safety" test by Clark has proven that this team scores relatively high on the inclusion safety scale, moderate on learning safety scale and has low level of psychological safety on the scales of contributor and challenger.

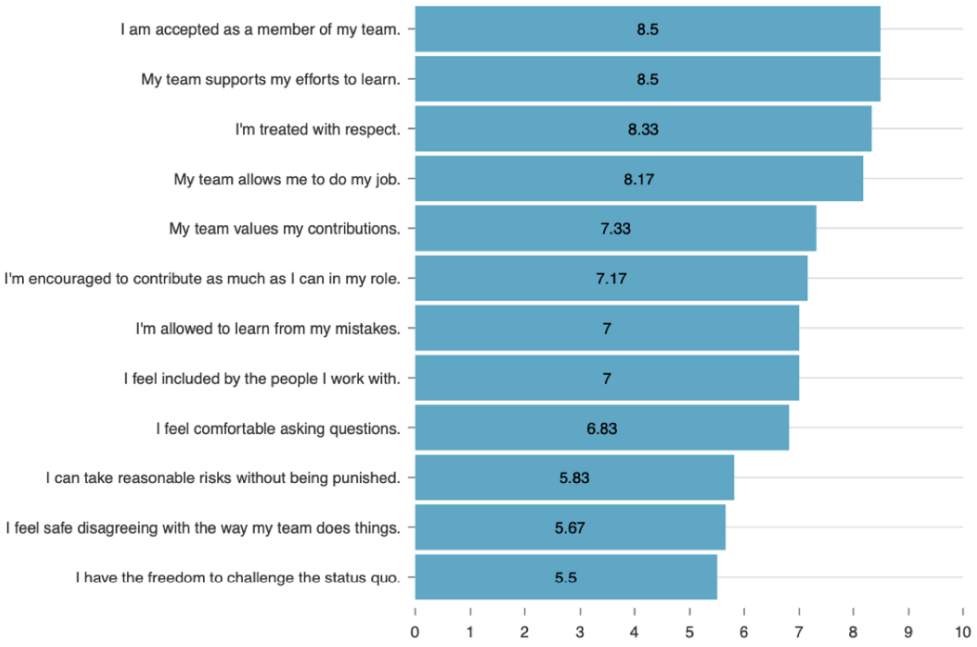

Figure 3: The results of the "4 Stages of Psychological Safety"

We would like to argue the one-sided way of interpretation of the above presented case studies, victimising followers. Setting aside their leading position, we need to accept the fact that leaders, just like the rest of us, are not a pure paragon of rationality, and that their behaviours are only human and sometime come from very unexpected places. To understand why a leader is both capable and unable to create the climate of psychological safety, we need to understand this leader's personal story.

3.1. Psychodynamic issues of leader-member relationships

Scholars and leaders who are seeking to understand the complexities of leader-member exchange, become more curious about the hidden undercurrents that affect human behaviours. Analysing both organisational leadership of unprecedented success (Richard Branson of Virgin, Steve Jobs of Apple, Mark Zuckerberg of Facebook) and crashing failures (Jeffrey Skilling of Enron, Bernie Madoff and Rajat Gupta of MacKinsey), scholars and practitioners now turn to the systems psychodynamic approach as a new paradigm for analysing the dark side as well as the atypical success associated with context-specific leadership practices. With the focus on the dynamics of human behaviour, this approach effectively demonstrates that people are complex, unique, and paradoxical beings who differ in their motivation patterns (Manfrend, Florent-Treacy, Krotov, 2013). The psychodynamic paradigm adapted and broadened theories of psychoanalysis from Freud and thinkers in other fields to encompass the hidden and overt dynamics that influence the behaviour of groups and organisations. Applied to leadership, this approach provides valuable frameworks and concepts for studying its various aspects. It considers what is "within": the inner world of individuals, including their emotions; relationships between individuals: and the "reality" that is created by the dynamics of group (Neumann&Hirschhorn, 1999). The psychodynamic orientation offers a practical way of recognising how organisations really function by making sense of leaders' and executives' deeper "wishes and fantasies" and showing how these "wishes and fantasies" affect their behaviours at work. Back in 1985 McDougall offered a perfect metaphor to describe the concepts of psychodynamic paradigm. He referred to it as the "inner theatre", which is filled with people who have influenced us, shaped our experiences of life. These early experiences create very unique response patterns, certain behaviours, which we later "transfer" to different contexts and repeat with different people (Manfrend, Florent-Treacy, Krotov, 2013). Within the "script" of person's inner theatre, certain themes develop and evolve over time. These themes – or "core conflictual relationship themes" - reflect the predominance of certain inner wishes that contribute to our unique personality style and translate into consistent patterns by which we relate to others (Luborsky & Crits-Cristoph, 1998). As Manfred et al. notices, "we project our wishes on others and then, based on those wishes, rightfully or wrongly, anticipate how others will react to us; then we react not to their actual reactions but to their perceived reactions." Sadly, the life-scripts, written in childhood, often become ineffective in adult life. A special place the psychodynamic theory gives to motivational need systems, considering them as operational code that drives personality (Lichtenberg, 1991; Lichtenberg and Schonbar, 1992). The need systems that particularly closely relate to life in organisations are the attachment/affiliation (Bowlby, 1969), and the exploration/ assertion (Bandura, 1989; White, 1959). Applying the framework of psychological safety by Clark, ideally, we should satisfy these needs moving to the next stage of psycholgocial safety on the Respect/Permission scale. Depending on the way an organisation meets these needs, individuals assert their desire to be a part of a community, their need for creativity and innovation. Manfred et al. in their discussion of psychodynamic concepts outline the four premises of the clinical paradigm: 1) the logical explanation behind every human act; 2) the "blind spots" to human awareness; 3) the ability to regulate and express emotions at the core of assessing personality; 4) human development is an inter- and intrapersonal process. Within the paradigm of psychodynamic approach, leader-follower interactions are subject to influence of different transferential processes: *mirroring and idealising* (Kets de Vries 2011; Kohut, 1971, 1985), *narcissism* (Freud, 1914; Kernberg, 1975; Kets de Vries, 1989; Kets de Vries & Miller, 1985; Kohut 1971, 1985; Maccoby, 1976), *identification with the aggressor* (Freud, 1966; Kets de Vries, 2009a), *folie á deux, or shared madness*, (Kets de Vries, 1979, 2001b). During and after the World War II, Freud's psychoanalysis raised a wave of interest among organisational scholars across Europe for application of aspects of clinical paradigm to the workplace.

It was claimed that "the inner world of the leader – his/her early childhood experiences and related hopes, fears, and desires – was extremely influential even at a systemic level in organisations, and should not be ignored." Abraham Zaleznik and Otto Kernberg argued that application of concepts of psychoanalysis to organisational life can help people better understand the irrational processes behind decision-making. Another group of researches focused on the properties and unconscious functioning of the group as a whole (Bion, 1961; Bion & Rickman, 1943), and hidden dynamics withing organisation that may directly influence leadership. French psychoanalysts and scholars used psychoanalytic conceptualisations to better understand the fantasies, projections, and identifications that play themselves out in groups (Mandel 1968; Anzieu 1972, 1999; Kaës, 1993; Enriquez (1992), Amado & Vansina 2005). Levinson proposed a concept of "psychological contract" between leaders and followers, claiming that leaders and managers need to pay attention to the conscious and subconscious needs of their employees. In his work "The workplace within: psychodynamics of organisational life", published in 1988, Hirschhorn elaborated on the irrational and emotional character of organisations in an effort to create healthier organisational culture. Even though the scholars recognise the limitations, Hirschhorn and Neumann argued that integrating psychodynamic and organisational theories would help to understand motivational forces of individuals, groups and their leaders. The next group of researchers investigated links between leadership and followers' attitudes, behaviours, and performance outcomes. Avolio et al. 2004 explored the way in which the intervening variables such as hope, trust, positive emotions and optimism might be influenced. While leadership behaviours moderate the creation of psychological safety in an organisation, the high level of psychological safety climate can become a mediating factor in enhancing members' confidence, optimism, hope, resilience at work.

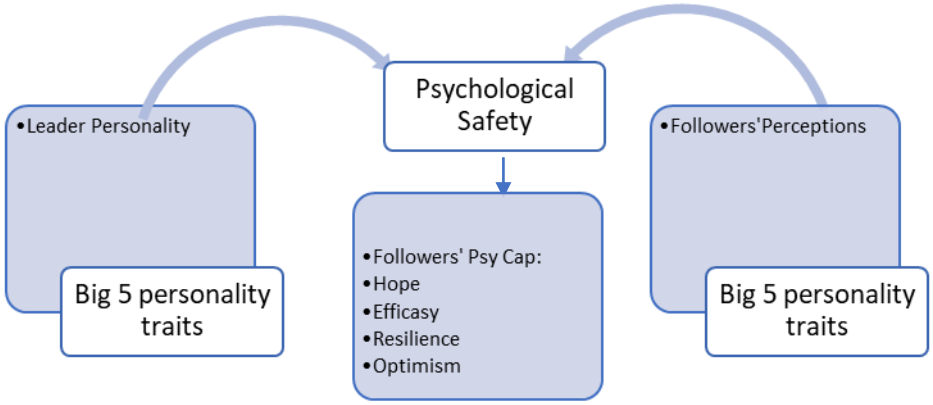

Figure 4: links between leadership and followers' attitudes, behaviours, and performance outcomes

4. CONCLUSION

An understanding of the influence of personal "stories" and "core conflictual relationship themes" can give us important insights into the team members' interactions in psychological safety. We consider that a leader holds the stewardship in setting the tone of an organisational climate tuned for innovation, learning and growth. Further, it is crucial to understand whether followers' perceptions of psychological safety can become a mediating factor in enhancing their attitudes, namely hope, optimism, resilience, confidence in an organisational setting.

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THE INFLUENCE OF PERCEIVED SOCIAL MEDIA MARKETING ACTIVITIES ON BRAND LOYALTY – SEM APPROACH

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ABSTRACT
This research aims to investigate the impact of social networks marketing activities on brand loyalty, value consciousness, and brand consciousness. In addition to this primary goal, the direct impact of value consciousness and brand consciousness on brand loyalty was also investigated. Based on previous research, a conceptual model was made, and hypotheses were formed. The structural equation modeling method using the SPSS AMOS 26 software package was used to test the models and hypotheses. Data for the implementation of the research were collected through an online survey. An online survey was conducted in the Republic of Croatia. During the survey period, five hundred and thirty-five (535) questionnaires were collected. Empirical research shows a statistically significant positive association of social media marketing activities with value consciousness, brand consciousness, and brand loyalty. A negative correlation was found between value consciousness and brand loyalty and a positive correlation between brand consciousness and brand loyalty. In addition to the scientific contribution, the results can help marketing experts in the formation and implementation of marketing activities on social networks.
Keywords: *brand consciousness, brand loyalty, customers, social media marketing, value consciousness*

1. INTRODUCTION

The accelerated development of new information and telecommunication technologies, the Internet and various social networks has affected all spheres of social life, especially marketing. Social media are present in individuals' daily lives and have a strong influence on communication that is increasingly changing and taking new forms. (Okazaki, 2009) According to Eurostat data for the Republic of Croatia, in 2018, 56% of the population aged 16 to 74 were active on social networks. As far as the European Union members are concerned, Denmark has the most users of social networks (79%). In comparison, Belgium (73%), Sweden, and the United Kingdom have a slightly smaller percentage of about 70%. (http://hr.n1info.com /Znanost/a415025/Drustvene-mreze-koristi-97-mladih-u-Hrvatskoj.html). Social media has become the most important method of reporting in the 21st century and allows its users to express their beliefs, ideas, and views in a whole new way. (Bamini et al., 2014) This way of communication has a substantial impact on the business of the company. Enterprises realize that without the right social media plan and strategy, their chances of quickly becoming prominent in consumers' minds are incredibly slim (Saravanakumar & Suganthalakshmi, 2012). Social networks make it easier for companies to understand customer needs, their purchasing behavior, and gain insight into their feelings and attitudes toward brands (Rockendorf, 2011). It allows companies to establish communication with consumers, precisely define their marketing message, and maintain the brand's presence in markets (Evans, 2012).

On the other hand, social networks facilitate the buying decision process and help customers get the most value for their money. (Ismail, 2017) In order to ensure the survival of the market, it is necessary to keep existing customers by developing relationships that lead to their loyalty. Social networks have a unique role in building loyalty. This research aims to investigate the impact of social networks and marketing activities that are carried out through this communication channel on brand loyalty, value consciousness, and brand consciousness. Besides, the relationship between value consciousness and brand consciousness with brand loyalty was investigated. The first part of the paper will present previous research on this topic and research methodology. The central part of the paper deals with data analysis and presentation of research results. The final part of the paper presents the conclusion, implications, and limitations of the research.

2. LITERATURE OVERVIEW AND HYPOTHESES DEVELOPMENT

Various factors affect customer loyalty to certain brands, and numerous studies have been devoted to this issue. Erdoğmuş & Cicek (2012), in their study of the impact of social media marketing activities on brand loyalty, conclude that it is positive if the brand "offers advantageous campaigns, relevant content, popular content, and appears on various platforms and offers applications on social media." Gautam & Sharma, (2017) find that social media marketing activities positively influence consumers 'purchase intentions of luxury brands. Godey et al. (2016), in their research, determine the positive effect of social media marketing activities on brand preference, price premium, and loyalty. Ismail (2017) also found a significant impact of social media marketing activities on brand loyalty, value consciousness, and brand consciousness. Iblasi et al. (2016), in their research, point to the significant impact of marketing activities on social networks on the process of making a purchase decision (need recognition, information search, alternatives evaluation, purchase decision, and post-purchase behavior). Following this, Bilgin (2018) determines the connection and influence of social media marketing activities on brand image and brand loyalty. In accordance with previous research, a conceptual research model was developed for this paper's purposes (Figure 1).

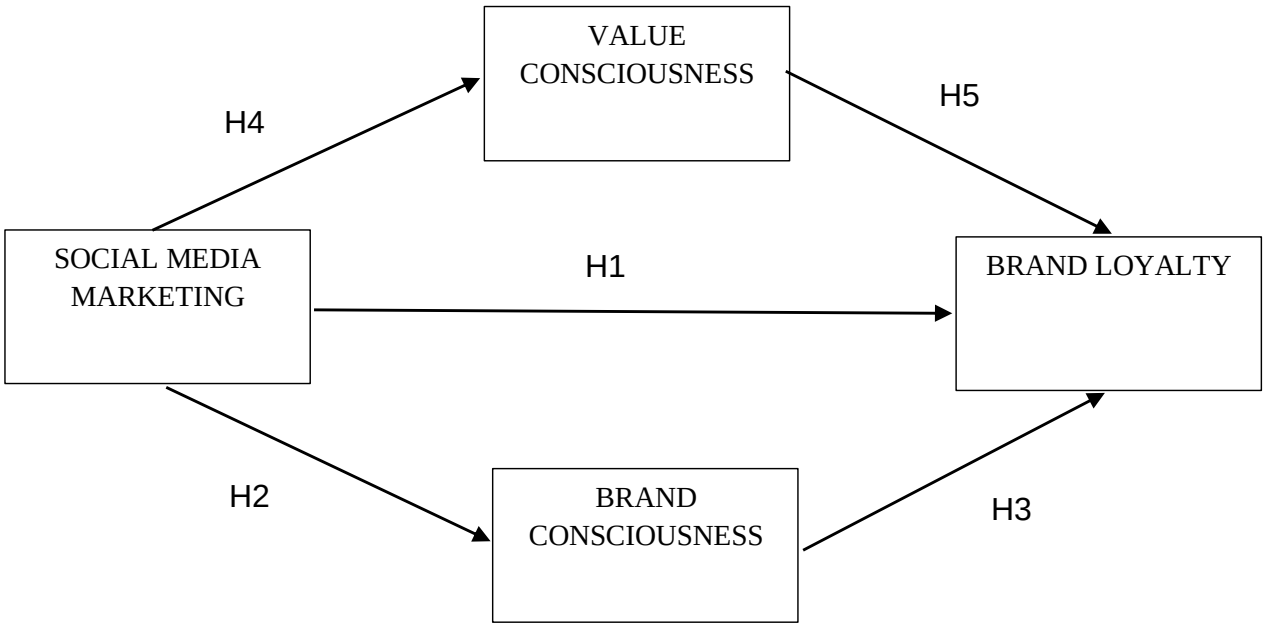

Figure 1: Conceptual model
(Source: The authors)

2.1. Social media marketing

Social media has become a hub for the promotion of goods and services. It enables companies to communicate with customers actively, represents a two-way communication channel, and enable greater customer collaboration and the creation of a sense of equality between consumers and their brands (Evans, 2012). Social media-based communication provides consumers with relevant information and reduces their effort in seeking the necessary information (Laroche et al., 2013). According to Kim & Co. (2010), social media can have a dramatic impact on a brand's reputation. According to a DEI Worldwide study (2008), 70% of consumers visited social media sites to get information about products or services, 49% of these consumers made a purchase decision based on information they found through a website or social network, 60 % of them stated that they are likely to use social networks to pass information to others. Furthermore, Enli & Skorgerbo (2013) state that customers most often use Facebook and Twitter to research products and services. Social media marketing offers many benefits to businesses. It enables companies to present their products to potential customers, listen to customer complaints and suggestions, and improve their product and adapt it to customers (Sajid, 2015). Based on previous research, hypothesis H1 was formed.

H1: There is a positive correlation between social media marketing activities and brand loyalty.

2.2. Brand consciousness

Brand consciousness is described as a personal and intangible assessment of a customer's product that exceeds its objective significance (Lemon et al., 2002). Brand awareness helps potential customers buy a product or service, reminds existing customers of the company's offering, and serves as a corporate emotional connection with all customers (Ou et al., 2014; Vogel et al., 2008). Manrai et al., (2001) point out that consumers very often identify with brands, while Escalas & Bettman, 2005 point out that consumers who possess higher brand awareness consider brands to be symbols of higher status. It is interesting to note that brand-conscious consumers buy expensive brands and remain loyal to the brand not because of the perception of quality as such, but because of other people's opinions (Bao & Mandrik, 2004). Based on previous research, hypotheses H2 and H3 were formed.

H2: Social media marketing activities are positively related to brand consciousness.
H3: Brand consciousness is positively related to brand loyalty.

2.3. Value consciousness

According to Sharma (2011), Value consciousness customers are oriented towards lower prices but not lower quality. In this context, social media platforms offer values in terms of achieving savings through lower prices, but also identifying the right products that meet customer needs and the ability to compare prices with other brands. According to Zeithaml et al. (2001), value consciousness is described as a customer's assessment of a product based on the attitudes of what is provided to him and what is received. On the other hand, Vogel et al., (2008) state the existence of three types of influence on value consciousness: quality, price, and practicality, while as key dimensions' value consciousness Ismail (2017) states: price-quality ratio, the convenience of purchase and usefulness of products and time. Based on the above, hypothesis H4 was formed.

H4: Social media marketing activities are positively related to value consciousness.

According to Russo (2014), 78% of consumers admit that they are not loyal to any particular brand.

During social media searches, value-sensitive consumers are motivated to buy products based on price. If the price is too high, the consumer can altogether reject their choice and look for a brand with a better price. Therefore, value sensitivity negatively affects brand loyalty (Ismail, 2017). Based on the above, hypothesis H5 was formed.

H5: There is a negative correlation between value consciousness and brand loyalty.

2.4. Brand loyalty

Customer loyalty is the willingness of customers to purchase products from a particular supplier repeatedly and to commit to that supplier in the long term despite the potential benefits of changing suppliers. (Algesheimer et al., 2005) It can be said that brand loyalty represents consumers' tendency to buy products of one brand in relation to the other brands continuously. According to Dick & Basu (1994), customer loyalty is seen as the strength of the relationship between a particular relative attitude and re-sponsorship. Zhang & Li (2019) in their research, talk about how the use of social media by companies affects the beliefs and risks of buying, and thus customer loyalty. Using reseller social media can improve customer belief in the ability, integrity, and goodwill of the salesperson, and the integrity and goodwill of the company can improve customer loyalty. On the other hand, Brodie et al. (2013) conclude that activities on social networks, such as creating a virtual brand community, positively affect customer loyalty. Following this, Asperen et al. (2017) examine the relationship between social media marketing and customer loyalty in their research. The results of the study show that consuming social media is directly related to effective loyalty.

3. RESEARCH METHODOLOGY

3.1. Scale development

The aim of this research is A) to investigate the impact of social networks and marketing activities that are carried out through this communication channel on brand loyalty, value consciousness and brand consciousness, B) to investigate the relationship between value consciousness and brand loyalty and C) to investigate the relationship between brand consciousness and brand loyalty. A 5-point ordinal scale ranging from 1 = strongly disagree to 5 = strongly agree, was used to measure the variables from the model. Tables 1 and 2 show the measuring scale and sources.

Construct	**Source**	**Number of items**
Social media marketing	Ismail (2017.), Evans, (2012), Kimu I Ko (2010),	4
Brand consciousness	Ismail (2017.)	4
Value consciousness	Ismail (2017.), Russo (2014)	4
Brand loyalty	Ismail (2017.)	4

Table 1: Measuring scales
(Source: The authors)

Table following on the next page

Construct		*Measurement items*
Social media marketing	PER1	I find interesting contents shown in social media about the brand I am considering to buy.
	PER2	It is easy to deliver my opinion about the brand I am considering buying through social media.
	PER3	Using social media to search for information about the brand I am considering buying is very trendy.
	PER4	I would like to pass along information on the brand, product, or services from social media to my friends.
Brand consciousness	SKL1	I pay attention to the brand names of the products I buy.
	SKL2	Brand names tell me something about the quality of the products.
	SKL3	Sometimes I am willing to pay more money for products because of its brand name.
	SKL4	Branded products that cost a lot of money are of good quality.
Value consciousness	COS1	I am very concerned about low prices, but I am equally concerned about product quality.
	COS2	When shopping, I compare the prices of different brands to ensure I get the best value for the money.
	COS3	When purchasing a product, I always try to maximize the quality I get for the money I spend.
	COS4	When I buy products, I like to be sure that I am getting my money's worth.
Brand loyalty	LOJ1	I would rather stick with a brand I usually buy than try something I am not very sure of.
	LOJ2	I have certain types of brands that I always buy.
	LOJ3	I consider myself to be loyal to one brand of product.
	LOJ4	I feel confidence in a brand that I always buy.

Table 2: Original measurement items
(Source: The authors)

3.2. Data collection

Data for the purposes of empirical research were collected using an online survey. The questionnaire was created using Google Forms, and the link to fill out the questionnaire was shared on the Croatian Facebook page "Looking for / offering a student job". The survey took place during January and February 2020. A total of 535 correctly completed questionnaires were collected. The demographic data of the respondents are presented below. (Tables 3, 4 and 5)

Gender	*Frequency*	(%)
Male	74	13,83%
Female	461	86,16%

Table 3: Gender of respondents
(Source: The authors)

Age	(%)
<18	3,9%
19-25	80%
26-30	11,6%
31-40	2,8%
41>	1,5%

Table 4: Age of respondents
(Source: The authors)

Household income	(%)
Below 1000	28,2%
1000-2000	30,1%
2000-4000	18,6%
Above 4000	23%

Table 5: Household income
(Source: The authors)

4. DATA ANALYSIS

To determine the factor structure, an exploratory factor analysis (EFA) was performed using the statistical software package SPSS 23. Confirmatory factor analysis (CFA) was performed to determine the reliability and validity of the measuring instruments and to test the hypotheses. The SPSS AMOS 26 software package was used for these purposes. The measuring construct's internal consistency and reliability were measured by determining the reliability coefficient (Cronbach's alpha). The values for each of the variables in the measuring instrument are higher than the reference value (0.7). The measured values are shown in Table 6.

		Internal reliability			Convergent validity			
Construct	Item	Cronbach's alpha	Item-total correlation	Factor loading	Composite reliability	AVE	Mean	SD
Brand consciousness	SKL1	0,805	0,548	,718	0,827	0,503	3,176	1,192
	SKL2		0,651	,649			2,806	1,076
	SKL3		0,689	,804			2,791	1,210
	SKL4		0,604	,656			2,645	1,046
Social media marketing	PER1	0,779	0,651	,848	0,895	0,47	2,434	1,397
	PER2		0,623	,782			2,865	1,448
	PER3		0,607	,588			1,744	1,111
	PER4		0,482	,452			2,372	1,435
Brand loyalty	COS1	0,680	0,446	,483	0,730	0,394	4,118	0,913
	COS2		0,423	,453			3,750	1,157
	COS3		0,550	,770			4,551	0,690
	COS4		0,528	,739			4,553	0,714
Value consciousness	LOJ1	0,822	0,513	,525	0,842	0,557	3,630	1,107
	LOJ2		0,772	,920			2,594	1,217
	LOJ3		0,709	,871			2,250	1,260
	LOJ4		0,597	,591			3,721	1,103

Table 6: Internal reliability and convergent validity
(Source: The authors)

The Kaiser-Meyer-Olkin and Bartlett tests were conducted to determine the suitability of the data for conducting exploratory factor analysis (EFA). Both tests show satisfactory values (KMO = 0.787, p = 0.000 <0.05). Exploratory factor analysis was performed on 16 items in the measuring instrument. The analysis identified four factors with eigenvalues above 1 and factor loads above 0.5. The selected four factors explain 61,949 % of the total variance. The results of the factor analysis and the isolated factors are shown in Figures 2 and 3.

Total Variance Explained

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	4,388	27,426	27,426	4,388	27,426	27,426	2,620	16,373	16,373
2	2,190	13,685	41,111	2,190	13,685	41,111	2,580	16,125	32,498
3	1,765	11,031	52,142	1,765	11,031	52,142	2,485	15,528	48,026
4	1,569	9,807	61,949	1,569	9,807	61,949	2,228	13,923	61,949
5	,851	5,318	67,268						
6	,737	4,606	71,874						
7	,673	4,206	76,080						
8	,648	4,052	80,132						
9	,599	3,743	83,875						
10	,509	3,181	87,056						
11	,464	2,901	89,957						
12	,408	2,552	92,509						
13	,404	2,522	95,031						
14	,315	1,967	96,998						
15	,301	1,883	98,882						
16	,179	1,118	100,000						

Extraction Method: Principal Component Analysis.

Figure 2: Factor analysis
(Source: The authors)

Rotated Component Matrix[a]

	Component			
	1	2	3	4
SKL1		,655		
SKL2		,819		
SKL3		,806		
SKL4		,796		
PER1			,781	
PER2			,751	
PER3			,799	
PER4			,696	
COS1				,678
COS2				,644
COS3				,784
COS4				,785
LOJ1	,686			
LOJ2	,869			
LOJ3	,829			
LOJ4	,737			

Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalization.
a. Rotation converged in 5 iterations.

Figure 3: Factors after Varimax rotation
(Source: The authors)

4.1. Confirmatory factor analysis (CFA)

A confirmatory factor analysis was performed to determine the measurement construct's convergent and discriminant validity. Convergent validity shows the degree of correlation of measures within the same construct. It is presented using a composite reliability coefficient (CR) whose value should be higher than 0.6 and average variance extracted (AVE) whose value should be higher than 0.5 (Ahmed et al., 2016). The average variance extracted (AVE) is considered a relatively conservative estimate of the validity (Lam, 2012); the two constructs do not meet the recommended level of 0.5. The values in Table 6 show satisfactory convergent validity. To determine that the individual constructs in the measuring instrument are different, i.e., and that they do not support coalition too much with each other the measuring instrument's discriminant validity was examined. According to the results, it is evident that there is a weak correlation between the constructs and the discriminant validity is good. Table 7

	SKL	PER	COS	LOJ
SKL	**0,709**			
PER	0,476	**0,685**		
COS	0,081	0,145	**0,627**	
LOJ	0,411	0,360	0,159	**0,746**

SKL -Brand consciousness; PER - Social media marketing; COS - Brand loyalty; LOJ - Value consciousness

Table 7: Discriminant validity
(Source: The authors)

4.2. Model verification using the structural equation modeling method – SEM

The method of modeling structural equations was applied to examine the adequacy of the model and test the set hypotheses. For this purpose, the statistical software package SPSS AMOS 26 was used. The suitability of the conceptual model is examined by determining the model fit shown through different values (GFI, AGFI, IFI, TLI, NFI, CFI, RMSEA, and SRMR). The obtained values are satisfactory, and it is concluded that the conceptual model is good. (Table 8) A graphical representation of the structural model with the connections between the constructs is visible in Figures 4.

Fit indices		**Recommended value**	**Source**
Chi-square	204,307; p<.0,001	93	
χ^2/df	2,199	< 5	Park & Kim, (2014)
GFI	0,954	>0,8	Halmi, (2016)
AGFI	0,932	>0,8	Halmi, (2016)
IFI	0,963	>0,9	Park & Kim, (2014)
TLI	0,952	>0,9	Kim & Han, (2014)
NFI	0,935	>0,9	Park & Kim, (2014)
CFI	0,963	>0,9	Hu & Bentler, (1999)
RMSEA	0,044	0,03 to 0,08	Hair et al., (2014)
SRMR	0,0494	<0,08	Hair et al., (2014)

Table 8: Fit indices
(Source: The authors)

Figure following on the next page

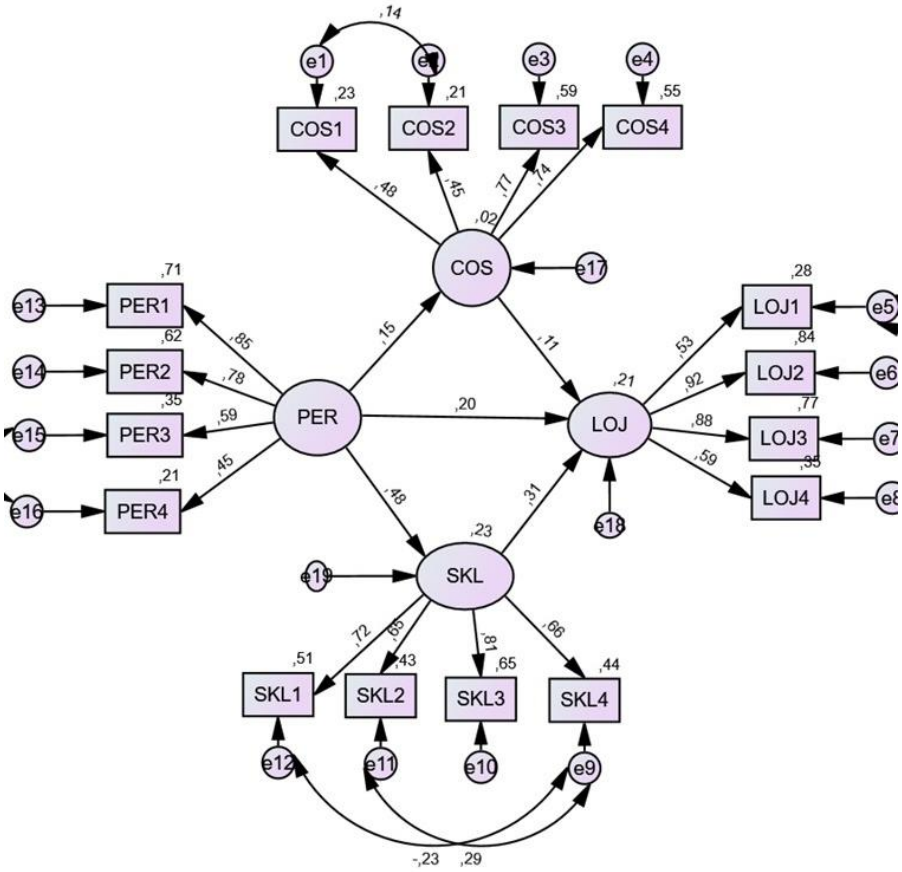

Figure 4: Structural model
(Source: The authors)

4.3. Hypothesis tests

The results of hypothesis testing are shown in Table 8. According to the results, hypothesis H1 was supported, a significant positive correlation between social media marketing activities and brand loyalty (ß = 0,197, CR = 3,405, p <0.001). Hypothesis H2 was also confirmed. It was found that social media marketing activities are positively related to brand consciousness (ß = 0,476, CR = 8,160, p <0.001). Hypothesis H3 was confirmed, a significant positive correlation between brand consciousness and brand loyalty exists (ß = 0,309, CR = 4,912, p <0.001). Hypothesis H4 was also confirmed; there was a positive correlation between social media marketing activities and value consciousness (ß = 0,146, CR = 2,613, p <0.05). Hypothesis H5 was confirmed, a significant negative correlation exists between value consciousness and brand loyalty (ß = 0,106, CR = 2,130, p <0.05). The results of hypothesis testing are shown in Table 9 and Figure 5.

Hypothesis	Independent variable	Dependent variable	Standard estimate	CR	P-value	Supported
H1 (+)	PER	LOJ	0,197	3,405	***	Supported
H2 (+)	PER	SKL	0,476	8,160	***	Suported
H3 (+)	SKL	LOJ	0,309	4,912	***	Suported
H4 (+)	PER	COS	0,146	2,613	0,009*	Supported
H5 (-)	COS	LOJ	0,106	2,130	0,033*	Supported

*** P < 0,001; * P < 0,05
PER - Social media marketing; SKL -Brand consciousness; COS - Value consciousness; LOJ - Brand loyalty

Table 9: Summary of the hypothesis testing results
(Source: The authors)

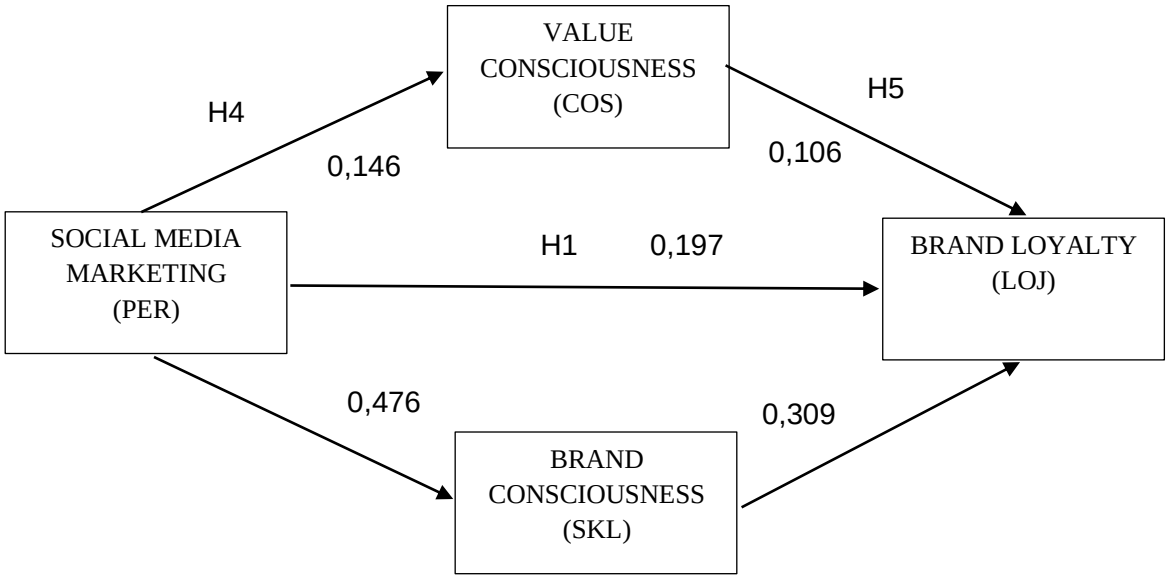

Figure 5: Results of a hypothesis test
(Source: The authors)

5. DISCUSSION, IMPLICATIONS, AND LIMITATIONS

The aim of this research is A) to investigate the impact of social networks and marketing activities that are carried out through this communication channel on brand loyalty, value consciousness and brand consciousness, B) to investigate the relationship between value consciousness and brand loyalty and C) to investigate the relationship between brand consciousness and brand loyalty. The research results show the existence of a significant positive correlation between social media marketing activities and brand loyalty. The results are consistent with previous research that found that marketing activities on social networks and the communities formed on them affect brand loyalty. Furthermore, a statistically significant correlation between social media marketing and brand awareness was found. According to the survey results, consumers positively perceive social networks as credible sources of information related to their brands. A positive association of social media marketing with the value consciousness was also found. It can be concluded that social media marketing has a strong influence on the brand followers who are value conscious. The results are consistent with previous research. The research also found a statistically significant negative correlation between value consciousness and brand loyalty. Previous research shows that value-oriented customers are not brand loyal. This is also demonstrated by the results of this research. Finally, a statistically significant relationship between brand consciousness and brand loyalty was found, which is in line with previous research. Two-way communication and up-to-date informing customers about the brand and all other activities in the company contribute to stronger brand awareness, directly affecting brand loyalty. This research's scientific contribution would relate to new insights into the impact of social media marketing in building and maintaining customer relationships. In addition to scientific contributions, the results can be useful to marketing experts in the implementation of marketing activities through social networks. The basic limitation of this research is the representativeness of the sample in terms of using only one social network in the survey process. This may call into question the representativeness of the sample. Other social networks should definitely be included in the next research.

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BEHAVIOURAL ACCEPTANCE PROCESS IN THE CONTEXT OF HIV PREVENTION AMONG RESIDENTS OF LATVIA

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ABSTRACT

Regardless of the fact that numerous social marketing interventions has been carried out, Latvia has steadily taken the leading position in the number of newly diagnosed HIV cases per 100,000 of the population in the European Union (EU). The Joint United Nations Programme on HIV/AIDS (UNAIDS) points out social marketing as one of the most important tool in the fight against HIV/AIDS. Social marketing eases the acceptance, rejection, modification, abandonment or maintenance of certain behavior. Thus, it aims to benefit society at large, or any part thereof, through the behavior change. To achieve a goal it applies traditional marketing principles and techniques to create, communicate and deliver value. Given that traditional marketing techniques are used in social marketing, it can be considered that behavioral acceptance can also be viewed through the prism of the purchase decision-making process, where purchase is the acceptance of a particular behavior. Moreover, social marketing practitioners should understand how and what may affect the purchase decision-making (behavioral acceptance) process of the target audience in order to understand how to influence their behavior. The aim of this study is to assess behavioral acceptance process of the residents of Latvia through the prism of the purchase decision-making process in the context of HIV prevention. To obtain data a survey of residents of Latvia was carried out. The research results show that respondents do not always reach the behavioral acceptance due to the lack of information or a product (service) that would facilitate the acceptance of the particular behavior. Thereby, it points to a gap in the social marketing communications. Based on the research findings authors developed proposals for social marketing communications improvements. Also further research directions are indicated.

Keywords: *Behavioral acceptance, HIV/AIDS, Marketing communications, Purchase decision-making process, Social marketing*

1. INTRODUCTION

Regardless of the fact that numerous social marketing interventions has been carried out, Latvia has steadily taken the leading position in the number of newly diagnosed HIV cases per 100,000 of the population in the European Union *(EU)* (ECDC, WHO, 2019) . The Joint United Nations Programme on HIV/AIDS *(UNAIDS)* points out social marketing as one of the most important tool in the fight against HIV/AIDS (Andreasen, 2002, p. 3). The aim of a social marketing is to benefit society as a whole or its part by influencing its behavior.

To achieve a goal it applies traditional marketing principles and techniques to create, communicate and deliver value (Kotler, Lee, 2008, p. 7). Social marketing differs from the traditional in several ways. For instance, its products are more complex, the demand is diverse, reaching the target audience is more challenging and consumer involvement is more intense. In the same way as in traditional marketing, the focus is on the consumer and exploring what people really want (Jha, 2013, pp. 1 – 2). Social marketing eases the acceptance, rejection, modification, abandonment or maintenance of certain behaviors (Grier, Bryant, 2005, p. 321) Thus, it can be asserted that social marketing benefits society by selling behavior and/or providing accessible a product which can influence a behavior of a target audience. In other words, a purchase as a result of social marketing is the acceptance of a particular behavior. The effectiveness of the use of social marketing for HIV prevention can be increased by implementing an integrated approach to marketing communication, which has been extensively studied by Batraga A., Skiltere D., Salkovska J., Bormane S., Legzdina A. (Batraga, Skiltere, Salkovska, Bormane, Legzdina, 2019, pp. 53 – 63). Given that traditional marketing techniques are used in social marketing, it can be considered that behavioral acceptance can also be viewed through the prism of the purchase decision-making process, where purchase is the acceptance of a particular behavior. According to World Health Organization *(WHO)* there are several HIV prevention ways, for instance, male and female condom use, testing and counselling, use of ARVs *(Antiretroviral drugs)* for prevention, harm reduction for people who inject and use drugs, elimination of mother-to-child transmission of HIV (WHO, 2020). For HIV prevention purposes, the behaviors that would be desired as a result of social marketing interventions and benefit the large groups of a society, rather than only small groups like drug users, are regular condom use during sexual contact and HIV testing. The purpose of this study is to assess behavioral acceptance process of the residents of Latvia through the prism of the purchase decision-making process in the context of HIV prevention. The tasks are to analyze academic and specialized literature on the theoretical aspects of purchase decision-making process, to conduct a survey among the residents of Latvia with the aim to assess behavioral acceptance process in the context of HIV prevention, based on the results of the study draw conclusions and develop proposals for social marketing communications improvements. Research methods used are the analysis of scientific literature and survey.

2. THEORETICAL BACKGROUND

Usually a purchase decision-making process consists of five stages: motivation (problem recognition), information search, assessment of alternatives, purchase decision and action after the purchase. The consumer can go through each of these stages one by one, as well as some of them can be skipped or sequence can be reverse. Also, it can be argued that the purchase decision-making process for the consumer begins long before the physical purchase of the product or service, but the consequences may appear long enough after that (Kotler, Keller, 2012, pp. 167 – 173). At the first stage, the consumer recognizes a problem, or in other words is aware of a need, which is a difference between the consumer's ideal (desired) and current situation, and this means that there is a difference between what the consumer wants and what he actually has. Thus, finding motivation for future purchase. The motivation can be caused by both internal and external irritants (Evans, Jamal, Foxall, 2006, p. 263). The authors believe that in terms of health, everyone recognizes the motivation to be healthy and does everything possible to protect their health. The consumer, aware of the need at the beginning of the process, gradually receiving information and evaluating alternatives, goes through the other stages of the process. Depending on the intensity of the need and the interest in the product, two types of information search are distinguished. The first one is a heightened attention when a consumer becomes more attentive and better perceives the information related to the product of interest.

The second, where the consumer shows more interest and activity in the search for information about the product is defined as an active information search (Kotler, Keller, 2012, pp. 167). Regardless the intensity of search, the information received by the consumer can be internal and external. Internal information is that already is stored in the consumer's memory. If the consumer does not have enough internal information, then he turns to external sources (Belch, Belch, p. 112). Based on the information that is obtained during the information search, customers compile alternatives. Often, customers exclude several alternatives by carrying out only a cursory assessment and draw up a short list of alternatives that can meet the needs that arise and meet the purchase criteria. Alternative comparison can be both rational and irrational (Capon, Capon, 2009, pp. 103 – 104.) One the main determinant of the customer's choice is their level involvement. There are high and low levels of involvement that determine different evaluation processes. In general, in the case of a high level of involvement, the consumer will evaluate the purchase more carefully, but in the case of a low level of involvement, the evaluation of the purchase will be much simpler. In the case of a high level of involvement, consumer behavior is characterized by a model of motivated choice, but in the case of a low level of involvement, it is characterized by a repeat purchase model (Jobber, Ellis-Chadwick, 2013, p. 122). Depending on the consumer, in one case each brand and criteria may be carefully evaluated, but in the other case the consumer will simply consider his/her daily alternative to be the best, without even considering the other alternatives (Solomon, Bamossy, Askegaard, etc., p. 273). It is very important to find out the criteria by which the consumer evaluates the alternatives, as well as the level of its involvement, as these two factors influence further communication with a consumer and possible promotion activities. Communication is crucial in the context of social marketing, as it can have a significant impact on the next stage of decision-making process – purchase decision (Krekula, Malenicka, Linder, etc., 2009, pp. 343 – 350). As was mentioned above one of the main goal of social marketing is to focus on population-based behavior change, what in result will be a purchased product of social marketing intervention. These behavioral changes may include acceptance and use of the product, access to services, or treat health protection/prevention. However, behavioral acceptance as a result of social marketing interventions is essential as the focus and responsibility shifts from productivity to use and satisfaction rates. Thereby, this affects the consumer's behavior after a purchase (Lefebvre, 2011, p. 60). Post-purchase evaluation is very important as it will affect both the consumer's own future (repeat) purchases and the purchases of other people who are influenced by the consumer (Capon, Capon, 2009, pp. 103). As discussed, a consumer behavior and purchase decision-making is a complex process that depends on a number of factors. Therefore, organizations use various communication measures to attract and retain consumer attention, make first and repeat purchases. In terms of HIV prevention an integrated marketing communication plays an important role in general, because, similarly to traditional marketing, the communication created in the case of social marketing can influence the behavioral acceptance of the target audience. Marketing communication with the HIV prevention target audience can be implemented through various communication channels. One of the most effective channels for maximizing audience engagement is the digital environment. Radionova-Girsa E., Batraga A., Salkovska J. study the use of the online channel in the context of marketing communication (Radionova-Girsa, Batraga, Salkovska, 2019). This means that behavior of a target audience also in the context of HIV prevention can be influenced, but social marketing practitioners need to pay attention to consumer behavior and try to find out what have a greater impact on it, with the aim of understanding how to influence this behavior in the future. In order to assess behavioral acceptance process of the residents of Latvia through the prism of the purchase decision-making process in the context of HIV prevention the population survey was conducted.

3. RESULTS AND DISCUSSION

The online survey was distributed via Internet verified webpages. The survey was conducted online, taking into account the sensitivity of the topic and based on facts that internet in Latvia is available in 85,4 % households and 83.7 % of the population aged 15 to 74 use internet regularly *(CSB, 2019).* The population of Latvia in the beginning of 2020 was 1 907 675 people (CSB, 2020). The required sample size with confidence level 95% and confidence interval 5 is 384. 526 respondents aged 13 to 64 took part in the survey. In addition, it should be noted that the sample is random. 370 (70.3%) female and 136 male (25.9%) participated in the survey. The largest represented age group of respondents is from 18 to 24 years (47.15%), which followed by the groups from 25 to 34 years (27%), 35 – 44 (11.03%), 45 – 54 (5.32%), 55 – 64 (2.66%), 13 – 17 (0.76%) and 32 respondents (6.08%) did not answer to the question about the age group. 330 respondents (62.74%) represent Riga city and the closest Riga suburb territory. Vidzeme, Kurzeme, Zemgale and Latgale statistical regions are represented by 34 (6.46%), 34 (6.46%), 28 (5.32%) and 42 (7.98%) respectively. Thus, it can be determined that the majority of respondents represent the population of the socially and economically active age in the Riga region, but other territories of Latvia are represented in the minority. As well, it should be noted that according to the Central Statistical Bureau of Latvia, the majority of the Latvian population (53%) lives in the Riga region (CSB, 2020). Thereby, the study is limited by an online survey, the results of which could exclude potentially significant segments of the population of small towns and rural communities. One of the first theories of motivation is Maslow's theory of human motivation. The theory is based on the belief that each person has five basic needs: physiological needs, needs for security, needs for belonging and love, needs for recognition, needs for self-realization. Maslow (1943) considered physiological needs to be the most important needs, without them, for instance, health, human being could not exist. In practice, this means that a person will be driven primarily by physiological needs (Maslow, 1943, pp. 370 – 396). Given that health is one of the physiological needs it can be considered that in the context of the purchase decision-making process the need to be healthy is already present in all individuals. Thus, it can be assumed that each person has the motivation and need to protect themselves from becoming infected with any viruses, including HIV. But, to protect themselves from becoming infected with HIV, people should know the ways in which they can become infected with HIV. In other words, people should have information. Therefore, respondents were asked to answer to 11 assertions regarding HIV, where three of them were true and eight false. Respondents were asked to mark their answer by "yes" if they agree with the assertion and "no" if they disagree. The distribution of respondents' responses to true and false assertions regarding HIV is summarized in Table 1 and Table 2.

True assertions	**Answer "Yes"**		**Answer "No"**	
	Number	**%**	**Number**	**%**
It is possible to get HIV infected by contacting the blood, blood products or donor organs of an infected person	496	94.3	8	1.5
An HIV infected mother can infect a baby during pregnancy, childbirth and/or breastfeeding	460	87.5	46	8.7
It is possible to get HIV infected during unprotected sexual contact	504	95.8	2	0.4

Table 1: The distribution of respondents' responses to true assertions regarding HIV (Source: authors' construction based on the survey data)

False assertions	Answer "Yes"		Answer "No"	
	Number	%	Number	%
You can judge whether a person is HIV infected by its look	6	1.1	498	94.7
Daily contact with an HIV positive person increases the risk of infection	188	37.5	318	60.5
If I do not have sex – I cannot get infected	30	5.7	476	90.5
If sex is practiced only with one partner then use of condom is not necessary	60	11.4	446	84.8
It is possible to get infected by contacting with HIV positive person in a common way	50	9.5	456	86.7
It is possible to get infected by contacting tears, salvia or sweat of an HIV positive person	62	11.8	440	83.7
HIV testing is a time-consuming and complicated procedure	38	7.2	468	89
I am not homosexual, I do not use drugs, I am not a sexual worker – HIV does not apply to me	64	12.2	442	84

Table 2: The distribution of respondents' responses to false assertions regarding HIV (Source: authors' construction based on the survey data)

Analyzing data from Table 1 it can be concluded that the majority of respondents in general are aware of possible HIV infection risks and understand the possible protection ways. This means that respondents also understand what behaviors would be acceptable in the context of HIV prevention – regular condom use during sexual contact and HIV testing. The same time, as it seen from Table 2, 37.5% of respondents still believe in the myth that daily contact with an HIV positive person increases the risk of infection. This may indicate a lack of information about the real situation and social marketing practitioners must pay more attention to education of society in this direction. Also, the existence of such views can also contribute to the stigmatization of society. Within the purchase decision-making process this information should be considered as internal information of the respondents, as during the survey the respondents were not given any kind of additional information on HIV/AIDS issues. In terms of an information search intensity it can be stated that 58.46 % (304) respondents show an increased intensity in the search for information as they have expressed a desire to improve their knowledge of HIV/AIDS and 41.53% (216) respondents represent the heightened attention of search for information, because there was no interest in an improvement of the existing knowledge. When there is a lack of internal information consumer turns to external sources. Therefore, respondents were asked to assess the external sources of information by scale from one to ten (where 1 – less frequent, 10 – most frequent). In Table 3 is represented data on the five most frequent and five least frequent information source used by respondents.

Table following on the next page

Most frequent information source	Mean	Median	Mode
Social media	6.14	7	10
Printed mass media (newspaper, magazine, etc.)	5.22	5	1
Informative printed materials available at a medical organizations	5.02	5	1
News Web page	5	5	1
Teacher at school, college or university	4.67	4	1
Least frequent information source			
Consulting on HIV prevention at HIV test point	2.29	1	1
Educational printed materials available at entertainment places (such as night club, cinema, etc.)	2.04	1	1
Support cabinet in health care organization (Equity Cabinet, etc.)	1.78	1	1
Pharmacist in pharmacy	1.57	1	1
Support /Trust hotline	1.22	1	1

Table 3: The assessment of respondents' external sources of information
(Source: authors' construction based on the survey data)

As it can be seen from Table 3 the most frequent information sources are such as social media, news web pages or teaching staff at educational organizations. This can be explained by the fact that the majority of respondents are in the age group from 18 to 24 years who usually are the most active Internet users as well as they represent student generation. In addition, the fact must be noted, that less frequent information sources are such as support line, support cabinet or consulting at testing point. Thus, it could be one of the weakest points in HIV prevention because the external information can be obtained from unknown unreliable internet sources, where information and its content may be affected and presented in the wrong way, unlike direct counseling sites, where counseling is provided by specially trained staff. At the time when the relevant information is obtained consumer decides in favor of any of the alternatives. In case of HIV prevention and behavior which can benefit the major part of a society it is condom use during sexual contact and regular HIV testing. Only 462 of 526 respondents assessed by the scale from one to 10 (where 1 – never, 10 – always) the frequency of unprotected sexual contact. The results are as follows: mean 5.82, median 6, mode 10. The results clearly show that respondents more often choose unprotected sex as well as median shows that the most popular answer is 10, what means that the most popular behavior among respondents do not use a condom during sexual contact despite their knowledge that during unprotected sex increases a risk to get infected. Similarly, the majority of respondents choose not to have regular HIV testing, see Table 4.

HIV testing frequency	Number	%
Never	264	50.19%
At least once every 3 months	18	3.42%
At least once every 6 months	24	4.56%
At least once a year	50	9.51%
Less than once a year	146	27.76%
No answer	24	4.56%

Table 4: among respondents
(Source: authors' construction based on the survey data)

Only 62 (17.49%) respondents choose to have HIV testing on a regular basis. This chosen behavior of respondents also serves as a gap in HIV prevention, because, same as in case of condom use, respondents have enough knowledge that HIV testing is not complicated and time consuming procedure. Therefore, it would be desirable to choose behaviors that support more frequent HIV testing. The data obtained also proves that respondents after chosen (purchased) behavior re-select it again. Such repeated choice of risky behavior not only serves as a shortcoming in the HIV prevention system, but also has a negative impact on people in the respondents' environment. This, in turn, motivates these people to choose inappropriate behavior in the context of HIV prevention.

4. CONCLUSION

Based on the results of the research and analyzing the acceptance of behavior through the prism of the purchase decision-making process in the context of HIV prevention, it can be concluded that respondents go through all of its stages. It assumed that each person has the motivation and need to protect themselves from becoming infected with any viruses, including HIV. Thus, there is a need for information. Results show that respondents have a high level of internal information and in general are aware of possible HIV infection risks and understand the possible protection ways as well as understand what behaviors would be acceptable in the context of HIV prevention – regular condom use during sexual contact and HIV testing. However, there is still a belief in some myths about HIV. The majority of the respondents show an increased intensity in the search for information as they have expressed a desire to improve their knowledge of HIV/AIDS related issues. The large part of the respondents are in the age group from 18 to 24 years who usually are the most active Internet users as well as they represent student generation, thus, this explains why such external information sources like social media or internet web pages are the most frequently used. There is also a need to be aware that information and its content in these sources may be affected and presented in the wrong way, unlike direct counseling sites, where counseling is provided by specially trained staff, which, in turn, are the least frequent sources of external information. Thus, the comparison of alternatives also may be affected. Despite the fact that respondents have enough knowledge about HIV/AIDS issues they do not choose a behavior suggested by social marketing interventions, but choose the exact opposite pattern of behavior. This is indicated by several results obtained during the study. The practice of unprotected sex is widespread among respondents, and the majority of respondents do not perform HIV testing at all or regularly. Moreover, respondents repeatedly choose such unfavorable behavior, thus influencing others. This leads to a conclusion that preventive measures in Latvia have several gaps and more attention must be paid to the factors that influence the choice of a target audience.

5. RECOMMENDATIONS

Taking into account that this study is limited by an online survey, the results of which could exclude potentially significant segments of the population of small towns and rural communities as well as the majority of respondents the age group from 18 to 34 years, the authors recommend in future studies to pay more attention to geographical areas that may have been excluded from this study, as well as to make a deeper study of the behavioral acceptance of the population over the age of 34 years. By conducting these studies, it will be possible to gain a full understanding of the acceptance of behavior in the context of HIV prevention among all residents. Also study on all factors that influence the existing behavioral acceptance must be conducted in order to undertand the existing unfavorable choise of respondents. Social marketing practitioners need to pay increased attention to segmentation of target audience and choice of communication channels. Also, as much as possible, efforts should be made to reach all segments of the population in an accessible and comprehensible way.

In addition, the promotion of on-site counseling places, for instance, support cabinet in health care organization, as a source of verified, unaffected and truthful information should be encouraged. People should contribute to a greater awareness of the fact that the responsibility for their own behavior is their responsibility.

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CHALLENGES THAT THE NATIONAL LEGISLATION ARE FACING IN THE ERA OF SOCIAL AND ECONOMIC CHANGES CAUSED BY DIGITALISATION

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ABSTRACT
Modern society is characterised by strong digitalisation of all aspects of life, from business to personal ones. Elements that once required personal presence, such as theft, threats, data misuse and abuse, sexual offenses and the like, are happening in the internet world nowadays. It is clear that the new, changed environment gives birth to completely new types of offenses, in addition to the fact that the old ones are moving into the electronic space. Therefore, national and supranational legislation must respond dynamically to these changes, and since threats, data theft, ransomware, sexual harassment, slut-shaming, harassment, theft of card money (or PayPal money and similar payment platforms), or peer violence now migrating to the e-zone, or they are predominantly happening there, it is urgently needed that the legislatures regulate these until recently unregulated areas through the legal measures. In this paper, we will try to make a comparative cross-section of legislative solutions in different countries and regions and analyse the advantages and disadvantages of individual solutions.
Keywords: *Cyber crime, digitalization, intenet, jurisdictions, law*

1. INTRODUCTION

The times we are living in are constantly chanhing, becoming more digital year after year. The corona-crisis only accelerated these processes, and the digitalization of the world has become worldwide and an everyday phenomenon. We can argue that theses changes would have appeared anyway, but the corona-crisis and the panic that followed suit, like avoiding personal contact and physical and social distancing, made these changes more swifty imposed, and for some people they really did come as a sudden surprise. But, the problems that existed in the past have already triggered some legal responses and discussions. Things like data theft, ransomware, sexual harassment, slut-shaming, harassment, theft of card money (or PayPal money and similar payment platforms), or peer violence have already been analysed by lawmakers, and some legal changed have been made to match the offences that did not exist in the past, but are more than real nowadays. The following chapters will try to present a short overview of the changes and challengesin the regulations and jurisdictions in the countries worldwide, item by item addressed in the Introduction.

2. DATA THEFT

The term *data theft* is actually incorrect in the digital world, as the data is usually not stolen but rather copied without authorisation. If the data theft occurs by influencing data processing, it is also referred to as computer fraud. The data can, for example, be taken from letters, by skimming or from the computer infrastructure. Computer criminals can also use phishing, vishing or snarfing to gain access to data without being noticed. Often a user is faked to the side of a known Internet service in order to illegally get to the data or to gain access to the corresponding user account. ATMs are also frequently and in a variety of ways the target of attackers who want to gain possession of information for logging into such devices, such as the account number or the personal identification number (PIN). The crime itself is usually primarily done by system administrators, who have the access to the database servers, computers (either desktop compueters or laptop computers), as well as the growing variety of

mobile devices which store digital data, like iPods, tablets and USB flash drives, but recently, there has been a hint that the digital cameras appeared as one of the viable carriers of stolen data, basically because of the memory cards that can store any type of data. The employees often create a huge variety of data for the company or state, they somehow sometimes feel free to copy the date or not to erase them from their computers, and to sell the data to the third parties, like competition, or even criminals and criminal organizations (Xing, Levitin, 2017). In many cases, stolen data is misused, for example to withdraw money without permission, forge identities or exploit trade secrets. Sometimes they deliberately abuse or misuse the trusted access to information to expose the misconduct performed by the employer. However, stolen data can also be published or leaked to the legal authorities, which in certain cases is seen as a kind of "whistleblowing". Known data thefts were carried out by Bradley Manning, Edward Snowden and Hervé Falciani. In some cases several million passwords are stolen from servers on the Internet, for example to compromise e-mail accounts by using them to send spam. The society tends to look positively to such acts (Schneier, 2013) and tries to shelter and protect the whistleblowers if it is about the company data. If it is a case of state-owned information, and furthermore, if it is the matter of national security, the states are persecuting these whistleblowers rigorously. The most common type of offence is when the employee copies the contact database from, the previous job, but it is so often that it is not even possible to trace it, since the employee can always claim that they "remember the contacts" from their frequent communications, and it is very hard to prove otherwise. The folowing table gives some numbers of greatest data thefts, with details.

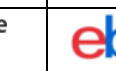
	2010	**2013**	**2014**	**2015**	**2015**	**2015**
Company	Betfair	Adobe	eBay	JD Wetherspoon	Carphone Warehouse	Talk Talk
Logo						
Total number of clients affected	3,090,000	40,900,000	145 million	657,000	2,490,000	157,000
Notes	3 million nicknames and key questions stolen; 90,000 bank details exposed	38 million nicknames passwords stolen; 2.9 million card names and numbers exposed	Names and addresses, dates of birth, phone numbers, emails and passwords	Full customer details registered for the sake of using the web	2.4 million names and addresses dates of birth and 90,000 bank details of customers	Names, addresses a dates of birth including 15,656 customers where their bank details were stolen

Table 1: The greatest data thefts in history, chronologically and by company names (Source: Paymentsnext.com)

Paymentsnext.com gives an extensive list of 17 Biggest Payments Data Breaches Ever (the lis ends in 2015), and we are quoting it (Paymentsnext.com, 2015).

- **Court Ventures (now owned by Experian) 2011** – 200 million accounts breached; estimated cost unknown to date. At Experian, Security Attrition Amid Acquisitions
- **NASDAQ 2006-2012** – 161 million credit and debit card numbers stolen; estimated cost to companies affected was $300 million "NASDAQ is owned." Five men charged in largest financial hack ever
- **eBay 2014** – 145 million accounts compromised; estimated cost included $200 million in class-action lawsuits alone. Cyber Thieves Took Data On 145 Million eBay Customers By Hacking 3 Corporate Employees

- **Equifax 2017** – 143 million accounts breached; estimated cost to be determined. The Equifax Hack Has the Hallmarks of State-Sponsored Pros
- **Target 2013/2014** – 30 million in 2013 and 70-110 million accounts in 2014 impacted; estimated to cost Target up to $162 million. Target's Data Breach Gets Worse: 70 Million Customers Had Info Stolen, Including Names, Emails And Phones
- **Heartland Payment Systems 2008/2009** – 108 million debit and credit cards affected; estimated cost included $110 million in payments to Visa and MasterCard by Heartland. Heartland Payment Systems Suffers Data Breach
- **Sony 2011** – 100 million accounts breached; estimated cost includes 65 class-action lawsuits totaling between $171 million and $1.5 billion. Sony Promises All PlayStation Services Will Return This Week (Again)
- **TJX/TJ Maxx 2003/2004** – 94 million accounts hacked; estimated cost to the company was $256 million. TJ Maxx data theft largest ever
- **JP Morgan Chase 2014** – 83 million personal and small business accounts hacked. JP Morgan Chase reveals massive data breach affecting 76m households
- **Home Depot 2014** – 56 million customers' personal data compromised the company said it cost them an estimated $33 million. Home Depot left customers' unprotected personal data online
- **Cardsystems Solutions 2005** – 40 million credit card accounts stolen. CardSystems Exposes 40 Million Identities
- **RSA Security 2011** – 40 million security tokens affected; estimated cost of $66 million in monitoring. Cyber attack on RSA cost EMC $66 million
- **Adobe 2013** – 38 million credit card accounts hacked; estimated cost $1.1 million in legal fees and unknown settlements to individuals. Adobe breach impacted at least 30 million users
- **Zappos 2012** – 24 million customers' personal data, last four digits of credit cards and passwords stolen; estimated cost $406,000. Zappos hacked, 24 million accounts accessed
- **Ashley Madison 2015** – 37 million customers financial records and data stolen; $11.2 million paid in settlements so far. Ashley Madison will pay $11.2 million to data breach victims
- **Staples 2014** – 1.16 million customers financial records hacked; estimated cost $148 million. Staples Breach Impacts 1.1 Million, Adds To Ongoing Retail Lapses
- **Global Payments 2012** – 1.5 million customer credit card accounts compromised; estimated cost $94 million. Global Payments Breach Tab: $94 Million

2.1. Legal response to Data Theft problem

The variety of countries have reacted to the Data Theft problem with different measures. In Germany, spying on data is punishable under Section 202a of the Criminal Code (StGB). In the version that came into force in 1986, the legislature made the unauthorized provision of data as spying on data a criminal offense. This provision only applies to data that is stored electronically, magnetically or otherwise imperceptibly. According to this, the prerequisite for the offense is that a perpetrator has not brought into his control of data that was intended for him - and that was specially protected against unauthorized access. (Bundesamt für Justiz, 2020) This means that not all unauthorized access to a computer system in general, but only in connection with spying on data is punishable. Preparing the crime is also a criminal offense, for example procuring the appropriate software. In Switzerland, zhe word data theft appears in media releases, but not in the criminal code. The Federal Prosecutor's Office has accused Hervé Falciani of data theft, but the charge is "unauthorised data acquisition" (Art. 143 (1) StGB). In the United States, there is an old law, which was entitled The Computer Fraud and Abuse Act

(CFAA). It was introduced and enacted in 1986, and subsequently the Cybersecurity Bill was created as an amendment in the existing law under the code 18 U.S.C. § 1030. The law "prohibits accessing a computer without authorization, or in excess of authorization" (Jarett, Bailie, 2010). Before the computer-specific criminal laws were enacted, computer crimes were prosecuted as mail and wire fraud but the application was not sufficiently good, since it was a new technology and required a completely new bill. In Spain, the name of the law is named Ley Orgánica de Protección de Datos y Garantía de Derechos Digitales (LOPDGDD). This law came into force on December 6, 2018, replacing the old Organic Law 15/1999 on the Protection of Personal Data. The objective of the LOPDGDD is to adapt Spanish legislation to European regulations, defined by the General Data Protection Regulation (RGPD), in force since May 25, 2018. Since the Cambridge Analytica scandal there was a higher pressure to reduce the collection of Big Data andit sale to interested parties. The Brexit referendum and Donald Trump election as an American President showed that the analysing data can be powerful tool if it is not regulated properly. As one of the analyses said: "and Kosinski soon developed simple but brilliant analysis. I. e. he concentrated on "likes": "he was able to evaluate a person better than the average work colleague, merely on the basis of ten Facebook "likes." Seventy "likes" were enough to outdo what a person's friends knew, 150 what their parents knew, and 300 "likes" what their partner knew. More "likes" could even surpass what a person thought they knew about themselves." – says Vice" (Milošević, 2017). Many jurisdictions tried to regulate the collection and sales of Big Data after that.

2.2. Whistlebowing

The disclosure of this conduct can be of several types: the violation of a law, rule or regulation that may be a threat to the public interest, such as fraud against health or safety laws or about political corruption. Whistleblowers can make their allegations internally, with other people in the organisation or externally to regulators, agencies, the media, or groups that have a relationship with the issue. They are frequently forced to face retaliation at the hands of the accused organisation or group, or indirectly related organisations and governments. Because of this, some governments have passed legal regulations to give them protection. The origin of the English term, whistleblower, comes from the practice of British police officers who blew their whistles by blowing on them, when they became aware of the commission of a crime. The whistle served to alert the public and other police officers to the danger.

2.3. Legal protection of whistleblowers

Legal protection for the practice of whistleblowing varies from country to country and may depend on the country where the reported activity occurred, where and how the secrets were disclosed, and how they came to be published or publicised. More than a dozen countries have adopted comprehensive whistleblower laws that create mechanisms for reporting violations and providing legal protection for whistleblowers. More than 50 other countries have adopted more limited protections under their anti-corruption, freedom of information, or employment laws. One of the most distinguished whistleblowers in the world was Erin Brockovich, a legal assistant, who brought to the general public the danger of hexavalent chromium, commonly used by the industry. She obtained 333 million dollars for the defendants of her process. This event was the plot of the eponymous film, starring Julia Roberts. In December 2010, the United States Senate passed a bill that protects government employees who report abuse, fraud, and waste (Davidson, 2010). In the case of Spain, the protection of the whistleblower in the framework of the complaint channels lacks any regulation at the state level, with only some regulations at the regional level (Hernandez, 2019). In November 2018, the European Parliament approved a whistleblower protection directive ("Whistleblower Protection Directive") that contains broad protections for the freedom of expression of whistleblowers in

the public and private sectors, including journalists, in all EU member states. European Union. The Directive prohibits direct or indirect retaliation against current and former employees in both sectors (Control Capital, 2019). In Serbia, by the Law on the Anti-Corruption Agency, in July 2011 the Director of the Agency adopted the Rulebook on the Protection of Persons Reporting Suspicions of Corruption (on Whistleblowers), the first such regulation in Serbia (Gočanin, Grujić, Đurić, 2013). The Serbian Parliament adopted the Law on the Protection of Whistleblowers on November 25, 2014. As of October 8, 2013, 107 people had requested the status of whistleblowers from the Anti-Corruption Agency, and a total of 53 people had received that status. More than a third of the total number of protected whistleblowers are employees of the special hospital in Sokobanja Gočanin, Grujić, Đurić, 2013). According to the data provided by the Agency, out of 107 persons who sought protection, 31 sought protection of anonymity, 72 did not seek protection of anonymity, and four did not state in the request whether they sought that type of protection. (The Ordinance is not clear enough on how to ensure the protection of anonymity, especially since the Agency should inform the head of the body in which the whistleblower is employed about his identity (Gočanin, Grujić, Đurić, 2013).) The agency stripped one person of his status as a whistleblower "because he did not report corruption in good faith." Although the law stipulates that a civil servant must file a report "in good faith" (a term unknown in modern law in Europe and the United States), the rulebook changed it to "good faith" and explained that it means that the whistleblower "has a good reason" to believe that the information he reveals is true, even if it is later established to the contrary and if he has no intention of achieving any illegal or unethical goal." The first consequence of the whistleblowing alarm is the possibility of retaliation. According to Article 2 of the Ordinance on the Protection of Persons Reporting Suspicions of Corruption, retaliation is defined as “any act or omission against a whistleblower that leads to the following harmful consequences: psychological or physical harassment or abuse, disciplinary proceedings, transfer to a lower position and detention. progress; making a decision on termination of employment or termination of employment contract; taking or imposing a measure that adversely affects employment status and working conditions; serious and real threats that any of the above measures will be taken." Although in principle whistleblowers are protected by the employer, it is very common for the employers to retaliate against them. For example, in the United States in 2011, although there was an increase in whistleblowing acts of 11%, the growth of retaliation increased by about 83%, which may have a negative effect on future whistleblowing. The incidence of physical violence has also increased, with only 4% of whistleblowers experiencing some form of physical violence in 2009, compared to 31% in 2011 and surpassing non-violent forms of retaliation (O’Rourke, 2012). The study found that those people who experienced retaliation were less engaged, more likely to resign within a year, and more likely to report their problems outside the company, to the media, or to regulators. Retaliation also undermines employees' trust in the company's leadership and discourages other employees from reporting illegalities (O’Rourke, 2012).

3. RANSOMWARE

A ransomware (a new word coined from the English ransom, and -ware, shortening of software), or "data hijacking", is a type of malicious program that restricts access to certain parts or files of the infected operating system and asks for a ransom in exchange for removing this restriction. Some types of ransomware encrypt operating system files, rendering the device unusable and coercing the user to pay the ransom. Some alternatives, for instance, have been proposed in Spanish to the English term, such as "kidnapping program", "kidnapper", "blackmail program" or "blackmailer". The same situation occured in other languages where the “ransomware” is not easily pronounced. Although attacks have become popular since the mid-2010s, the first known attack was carried out in the late 1980s by Dr. Joseph Popp.

Its use grew internationally in June 2013. The McAfee company noted in 2013 that in the first quarter alone it had detected more than 250,000 unique types of ransomware.

3.1. Weak legal answer to ransomware attacks

The jurisdictions have acted differently when it came to punish the ransomware attacks legally. The American state of Maryland tried to persecute ransomware attack severel, so in the first draft of their HB 340 "made it a felony to create ransomware, punishable by up to 10 years in prison" (Fields, 2017). This provision was found too harsh by later readings so it was dropped from the final version of the bill. However, in Japan, a minor was arrested for creating and distributing ransomware, thus extorting money from infected owners (Wei, 2017). But in the UK, the things went very harsh for cyber criminals. Namely, "a British student Zain Qaiser (24) from Barking, London was jailed for more than six years at Kingston Crown Court for his ransomware attacks in 2019" (Casciani, 2019). He was widely considered to have been "the most prolific cyber criminal to be sentenced in the UK" (Casciani, 2019). It is believed that he earned more than £4 million in his career. Since he formed a whole malware gang called Luke and got connected with Russian hackers, the legal persecutions followed in Russia and the USA. Russian police "arrested 50 members of the Lurk malware gang in June 2016" (Rivera, 2016) while "Raymond Odigie Uadiale, a naturalized US citizen of Nigerian descent, was jailed for 18 months" (Nichols, 2018). The more precise juridical answers to such a threat as ransomware attacks is yet to be seen and drawn as bills in majority of countries, since the perpetrators are being punished according to the huge variety of other laws and bills, so the comprehensive approach which would take into an account the sophisticated nature of such crimes will be needed in the nearest future.

4. ONLINE SEXUAL HARASSMENT AND CYBERSTALKING

Since a great deal of sexual encounters and communication migrated to an online world, the acts that were previously restrained in the physical world are now prevalently happening in the digital world, and the jurisdictions do not seem to be ready. Here are some facts and figures.

4.1. Online sexual harassment data

The United States Department of Justice statistics "suggest that 850,000 american adults—mostly women—are targets of cyber-stalking each year, and 40 percent of women have experienced dating violence delivered electronically" (Sweeney, 2014). Another study "performed by the Pew Research Center found 40 percent of adult internet users have experienced harassment online, with young women enduring particularly severe forms of it and thirty-eight percent of women who had been harassed online reported the experience could be described as extremely or very upsetting to them". (Sweeney, 2014)

4.2. Online sexual harassment and cyber staling definition

Danielle Citron, a professor at the University of Maryland's Francis King Carey School of Law is an expert in this branch of the law, and we quote the following definitions of cyber stalking made by her: "threats of violence (often sexual), spreading lies asserted as facts (like a person has herpes, a criminal record, or is a sexual predator), posting sensitive information online (whether that's nude or compromising photos or social security numbers), and technological attacks (falsely shutting down a person's social-media account)" or a combination of various or even all aforementioned behaviour or acts (Sweeney, 2014).

4.3. What can the jurisdiction do?

Cyberstalking in general is the use of the Internet or the use of other electronic communications to spy on or harass an individual, group of individuals, or organisation. It may include false

accusations, surveillance and threats, identity theft, damage to data or equipment, seeking minors for sex, or gathering information to harass others. The definition of harassment must satisfy the criterion of being a reasonable person, possessing the same information, whether it would be considered sufficient to cause suffering to another reasonable person (Bocij, 2004). Cyberbullying is different from spatial or offline (non-Internet) stalking. However, this sometimes leads to it, or is accompanied by the same. The legislation on cyberstalking, which includes slut-shaming, sexual harassment and peer violence, is being very dynamically developed across the world. We will, in this paper, try to enlist some of the leading solutions in this area by jurisdictions.

4.4. What did the jurisdictions actually do?

4.4.1. United States

The current Federal law against cyber-stalking is at 47 USC sec. 223. The first U.S. cybercrime law came into force in 1999 in California. Other states include a ban on cybercrime included in harassment or harassment laws. In Florida, HB 479 was introduced in 2003 to ban cyberstalking. The law was enacted in October 2003. Of all the Amrican states, Alabama, Arizona, Connecticut, Hawaii, Illinois, New Hampshire, and New York have included prohibitions against harassing electronic, computer or e-mail communications in their harassment legislation, while the State of Texas has the *Stalking by Electronic Communications Act*, enacted in 2001.

4.4.2. Australia

In Australia, the Stalking Amendment Act (1999) includes the use of any form of target attack by cyber technology as a form of "criminal stalking".

4.4.3. United Kingdom

In the United Kingdom, the Malicious Communications Act (1998) classified cyberbullying as a criminal offense.

4.4.4. Spain

In Spain, information on cybercrime can be obtained anonymously from security agencies:

- Telematics Group
- Mossos d'Esquadra in Catalonia
- Ertzaintz in the Basque Country

4.4.5. Poland

Stalking, including cyberstalking, was made a criminal offence under the Polish Criminal Code on 6 June 2011.

4.4.6. Serbia

In Serbia, which is a signatory to the Convention on Cybercrime and which also has a special prosecutor's office for high-tech crime, there are not enough legal regulations governing this area. But as a country in transition, the NGO sector is expanding, so there are several NGOs that deal with this problem and one of them is NOOR - one of the goals of which is to create security on the Internet.

5. CONCLUSION

In the world nowadays there is a huge shift from the classical physical environment and social life to an online world with non-physical presence on the Internet. The people’s choices and the way of life are changing every year, and the year 2020 was especially interesting since the

whole process accelerated because of the corona-crisis. The jurisdictions have finally understand the necessity of new lawmaking, in which the certain misconducts and crimes will have to be punished properly, and not neglected simply because they are happening in the virtual space, and not the real one. The new laws are appearing in every country and every state around the globe. Cybel-stalking, online sexual harassment, data theft and digital ransoms by ransomware hacker attacks are on the rise, so the legislation must follow suite. The recent scandal by Cambridge Analytica which showed us that even the referenda and elections can be altered or influenced by Big Data, its collection and selling for analysis, show us how fragile our new world is, where the people educate online, form their political opinions online, date online, pay online etc. The new juridical solutions have to be modern and flexible, and certain countries are more efficient in the batte against new perpetrtators of new crimes, and the others must follow suit immediately if they do not want to be left behind in a "dark criminal spots" of the world

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THE BROKERAGE INSURANCE COMPANIES UNDER COVID-19 FRAMEWORK (THE BULGARIAN EXPERIENCE)

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ABSTRACT

The history of insurance and insurance mediation in Bulgaria can be divided into four periods - from 1878 to 1946; from 1946 to 1989; from 1989 to 2007; and after the accession of Bulgaria to the EU in 2007. The most significant regulatory at the end of the penultimate period and the last period are related to the establishment of the Financial Supervision Commission (2003), the adoption of the first Insurance Code (2005) of the second, still valid new Insurance Code. The analysis shows that the legislation of insurance intermediation in Bulgaria is undergoing significant development in the direction of improvement and adaptation to evolving and complicating modern market conditions. The most significant trends that are observed are in the direction of explicitly differentiating the functions of brokers and agents; strengthening the requirements for education and qualification of the persons managing and the persons directly

carrying out the activity of insurance mediation; development of the licensing and registration regime; subordination of the requirements for brokers and agents and to other categories of persons engaged in mediation (employees of the insurers themselves in direct sales, as well as intermediaries developing insurance mediation as an additional activity). After 2007, all changes are in the direction of synchronization with EU legislation and protection of consumers of insurance products. The most significant features and current challenges of the global and Bulgarian insurance market and in particular of the intermediaries working on it are related to changes in the general economic conditions. Here are added changes in the financial system, regulations, the emergence of new types of risk, changes in the insurance business (digitalization), and the cycle of the insurance market. Among the changes with the most significant impact since 2020 is COVID-19 as a new, global systemic risk with a huge impact on all economic agents and on the value of insurance estimates.
Keywords: *Insurance market, Brokerage insurance companies, COVID-19*

1. INTRODUCTION

Risk management is one of the oldest issues in virtually all areas of human activity and particularly in the financial and economic spheres. From a theoretical point of view, we can distinguish three main methods of risk management - diversification, hedging and, of course, insurance. Each of these methods is applied in a different field, where it is adjusted to address different types of risk. Insurance is the most important and perhaps the oldest of these methods. Its origins can be traced far back in the economic history of mankind. Insurance mitigates the risk by distributing it among a large pool of individuals and/or legal entities. Written laws have remained since ancient Babylon, according to which in cases of what we now refer to as "catastrophic risk events" debtors were relieved from the obligation to repay their debts, i.e. the effects of the event were, to a certain degree, transferred to the other people. One of the oldest "relatives" of insurance in the course of its evolution is insurance intermediation. We can even speculate which of the two types of business originated first and hatched the other. Anyway, what is essential in this respect is that insurance is very closely related to and interdependent with insurance intermediation.

2. INSURANCE INTERMEDIATION AND INSURANCE BUSINESS

2.1. Insurance development framework

The reason for this interdependence is that the insurance market is characterized by significant information asymmetry, which is often to the detriment of the insurer rather than its clients as would normally be the case in other markets. Consumers face the problem of insurance product complexity, because the quality of these products cannot be assessed by the customer before their purchase (experience goods) and quite often after they are purchased as well (credence goods). This is why the role of insurance intermediaries is extremely important for both types of agents in this market. Insurers compensate information asymmetry by providing the consumers with information about product characteristics, popularity, etc. Intermediaries provide clients with information that enables them to compare and evaluate the products and thus gives them the opportunity to make an informed and effective choice. Since insurance intermediaries play such an important role, the analysis and consequent optimization of their activities are extremely important and relevant. This is also confirmed by the fact that modern economic and social conditions are extremely dynamic – the general financial and economic conditions constantly change, economic crises are followed by periods of economic growth, new and unknown risks emerge and create demand for insurance coverage. On the other hand, the insurance sector is one of the most strictly regulated sectors of the economy. Insurance regulations strongly affect the operations of insurance intermediaries in several aspects. First of all, the related regulations can be categorized into two groups: (1) those that directly affect

the insurance intermediaries, their administrative and legal organization, incl. the requirements their employees should meet, etc. and (2) regulations intended for other sectors which have a substantial indirect effects for insurance intermediaries' business. The latter include requirements for compulsory insurance lines which form a large percentage of insurance sales in general (e.g. third-party liability.) Secondly, these regulations have both merits and demerits - in some cases they increase the business volume and profits and in other cases they impair the profitability of insurance intermediaries. This proves the relevance of a study on the management of insurance intermediaries and justifies the need to refine their management models for financial analysis of their activities so that their management decisions could take into account both the specific conservatism of the insurance business and the dynamic environment and regulatory changes.

2.2. Risk management and insurance products

Insurance has a number of advantages as well as disadvantages compared to other methods of risk management. As we mentioned above, it requires a certain level of socio-economic development, as the successful distribution of risk and the achievement of low premiums depends on the size of the pool of insured entities as well as the insurance culture of the society. Insurance is also not suitable for certain types of activities, such as investments, where risk taking is essential for achieving results. At the same time, investment risk insurance would be associated with such high premiums that it would offset the potential return. As Prodanov (Prodanov, 2017) points out, "insurance is a conservative science in which innovation enters slowly, and the dominant business model has remained unchanged since the beginning of the twentieth century." Nonetheless, we can distinguish some technological and financial innovations, which did not change the basic idea and logic of insurance, but radically affected the way in which it is carried out. Such innovations were the Blockchain technology and Smart Contracts, the Internet of Things concept, and insurance securitization – the transfer of insurance risk to the capital markets изследване (Prodanov, 2017). The last one has been increasingly popular for quite some time (for the last 20 to 30 years) and the integration of different types of risk management and especially between insurance and hedging has been on the increase. According Georges Dionne (Dionne, 2013), the use of derivatives as risk management instruments arose during the 1970s, and expanded rapidly during the 1980s. Another aspect of the above factors of change in insurance, the digitalization and digital marketing, leads us to a very important element of insurance - the distribution of insurance products. As in many other sectors of the economy and in particular in the sector of financial services, market evolution in insurance has resulted in division of labour and specialization, thus creating the role of the insurance intermediary as a link between the client and the insurance company. Insurance intermediaries generally fall into two categories - insurance agents who work for the insurance company and insurance brokers, who are independent of any insurance company and represent the interests of the buyer in searching for insurance coverage. It should be noted that this publication focuses primarily on and expresses the point of view of insurance brokers due to a number of reasons, the most important of which is that since insurance agents are in most cases employees of insurance companies, insurance brokers are actually the really independent insurance intermediaries.

2.3. Insurance intermediation and insurance brokers

According to the Insurance Code in Bulgaria, insurance intermediaries are classified as insurance brokers and insurance agents. Insurance broker is an intermediary who is independent of any insurance company and who represents the interests of the buyer in searching for insurance coverage. Insurance agents, on the other hand, protect the interests of the insurance companies and are often de facto their employees.

Insurance agents (IA) are independent (multi-agents) if they work with multiple Insurance Companies (IC) and dependent (tied) when they work exclusively for one IC. The specifics of the activity of the insurance companies determine their tendency to focus on the insurance product itself and to outsource most of its marketing to external contractors. Thus, through functional specialization (which is essentially a type of socio-economic division of labour) a higher efficiency of the whole system is achieved. Dahlen and Napel (Dahlen, Napel, 2004) also argue that a mediated market of insurance products would be more efficient. They give two reasons why mediated exchanges between two parties may lead to greater added value for both parties than direct sales. First of all, there is a minimization of transaction costs. This seems illogical because intermediation implies an additional markup. However, the authors explain that an intermediary can provide an economy of scale in terms of the costs associated with collection of information as well as product marketing. And this is really the case - intermediaries already have networks of clients and information databases which an individual insurer would have to incur a lot of costs to build. Dalen and Napel's second argument for using intermediaries to achieve greater efficiency is that they can diversify the risks and thus be reliable third parties in transactions. This solves some problems associated with the unfair behaviour of the party which is in a stronger position or the existence asymmetric information. Both authors emphasize that these aspects of transactions have different weights in different areas of economic activity but are crucial in the insurance industry. This draws attention to another function of insurance intermediaries, which makes them particularly important for the insurance market in general - the information function. Linking the client and the insurance company, the insurance intermediary provides information flow in both directions. Information about existing products, their characteristics and price is directed to customers and allows them to compare them and make an informed decision. For insurers, the intermediary is a valuable source of information about demand in quantitative and qualitative terms, about preferred products, about the reaction of consumers to changes in market conditions. It is important here to emphasize the advisory function of the broker where customers are often ignorant of the risks associated with their activities. This advisory role gives the broker risk management functions in relation to their clients. Since some of the intermediaries work with several or all insurers on the market, they have and can provide the most accurate information about the competitive structure and the market position of each insurance company. The information function of insurance intermediaries was investigated by number of authors. Eckardt (Eckardt, 2007) explores in depth its benefits by developing a theoretical model of insurance intermediation from the standpoint of the general theory of information intermediation. According to him, insurance markets are characterized by incomplete information for both parties. This can lead to two problems – adverse selection due to reduced awareness of the existing risks and moral hazard behaviour based on information advantage (in terms of asymmetric information). Moreover, private insurance against the risks of longevity, unemployment, illness or disability are goods whose quality is difficult to assess in advance (experience goods) or even after their consumption (credence goods). The situation is aggravated further due to the long-term duration of most such policies. This means that consumers need not only be informed about the characteristics of the available products, but also advised on their quality and relevance for each specific case. These problems require the intervention of intermediaries. According to the same study (Eckardt, 2007), customers would rather use of the services of an intermediary when the gain in intermediated exchange is greater than the gain in direct exchange. This problem can be expressed with the following equation:

(1) $(V^D\text{-}C^D)\text{-}(T^D_{Con} + T^D_{Ins}) < (V^I\text{-}C^I)\text{-}(T^I_{Con} + T^I_{Ins})$,

where:
VD – the value the insured consumers yield, which equals their willingness to pay given the opportunity costs of the insurance company;
CD – opportunity cost;
T_Con^D – transaction costs of the insured consumer in direct exchange;
T_Ins^D – transaction costs of the insurance company in direct exchange;
$(V^D\text{-}C^D)\text{-}(T^D_{Con} + T^D_{Ins})$ – net gain in direct exchange;
$V^I, CI, T^I_{Con}, T^I_{Ins}$ – the above variables in intermediated exchange;

Intermediaries benefit in two ways (1) by being able to gain more from the transaction process (e.g. lower prices, higher sales volume, etc.) or (2) by economizing on transaction costs over the whole transaction process. Even when the net gain of intermediates exchange is the as in direct exchange, such that (VD-CD) = (VI-CI), intermediaries can still economize on transaction costs. According to Eckard, this economy is achieved through (1) coordination cost savings; (2) absolute cost advantages due to division of labour, specialization, and learning effects; and (3) economies of scale with respect to the fixed costs of a transaction (Rose, 1999; Spulber, 1999a). Coordination costs are lower in intermediated exchange than in direct exchange since the number of contacts between potential trading partners is reduced by bringing in an intermediary, because no all insurers have to contact all consumers and vice versa.

3. THE INSURANCE MARKET IN BULGARIA

The actual significance of the intermediaries can be assessed on the basis of their share of gross premiums received by insurance companies through intermediaries. Table 1 presents this information for Bulgaria and the European Union since Bulgaria's accession in 2007. Based on the above table, it can be concluded that after Bulgaria's accession to the EU, the insurance brokerage in Bulgaria developed rapidly and its share was growing at a stable rate. Other studies on the subject indicate similar data (Mitkov, Atanasov, 2018). They also confirm that during the same period there was an increase in the number of brokers and a decrease in the number of insurance agents. Both conclusions show that the Bulgarian insurance market has developed free-market mechanisms, insofar as brokers are independent market intermediaries. Interestingly, the share of the gross premium income of insurers received through brokers in Bulgaria is significantly higher than the EU average.

	Life			**General**			**Total**		
Year	Bulgaria brokers	EU brokers	EU agents	Bulgaria brokers	EU brokers	EU agents	Bulgaria brokers	EU brokers	EU agents
2007	12.8%	16.2%	34.3%	29.3%	27.6%	48.8%	26.6%	25.9%	40.0%
2008	17.3%	16.4%	34.0%	38.1%	28.4%	48.7%	34.9%	18.5%	39.8%
2009	18.6%	23.3%	33.9%	44.0%	29.5%	46.7%	40.6%	14.5%	38.4%
2010	18.2%	21.1%	28.8%	48.0%	25.9%	46.1%	43.4%	13.7%	34.6%
2011	22.3%	11.2%	31.7%	48.2%	26.9%	46.5%	44.2%	13.6%	37.7%
2012	22.1%	10.5%	29.1%	49.8%	26.5%	44.9%	45.2%	15.5%	34.2%
2013	21.8%	10.4%	31.2%	49.1%	24.5%	45.6%	44.3%	17.1%	35.1%
2014	20.9%	9.2%	28.0%	52.4%	21.4%	45.6%	46.3%	11.3%	34.2%
2015	25.5%	13.1%	25.8%	50.8%	24.1%	44.2%	45.8%	12.9%	34.3%
2016	25.0%	5.0%	33.8%	53.9%	24.2%	43.8%	47.9%	13.3%	32.2%
2017	26.8%			56.2%			50.4%		
2018	28.9%			58.0%			53.0%		

Table 1: Gross premiums received through intermediaries
(Source: www.fsc.bg and https://www.insuranceeurope.eu/insurancedata)

Table 2 shows the top three types of insurance in terms of insurers' premium income share generate through brokers. The solid black cells show the top-ranking type of premiums for the respective year. From 2014 to 2018 this position was held by motor insurance. The cells shaded in grey show the second-ranking type of insurance premiums. The cells shaded in light grey and numbers in bold italics show the types ranking third. Note that in different years this position was held by different types of insurance.

YEAR	2014	2015	2016	2017	2018
TYPE OF INSURANCE					
accident	2.0%	2.3%	2.1%	2.1%	1.9%
sickness	2.4%	2.9%	2.9%	3.3%	3.0%
land vehicles others than railway rolling stock	31.0%	30.6%	32.1%	32.0%	28.2%
railway rolling stock	0.0%	0.1%	0.1%	0.1%	0.1%
aircraft	0.0%	0.0%	0.0%	0.0%	0.0%
ships	0.3%	0.3%	0.3%	0.4%	0.2%
goods in transit	0.7%	0.6%	0.6%	0.6%	0.5%
fire and natural forces	7.1%	6.5%	6.6%	5.7%	5.6%
other damage to property	2.6%	3.6%	2.6%	2.5%	1.8%
motor vehicle liability	41.9%	41.0%	41.0%	42.0%	49.0%
aircraft liability	0.1%	0.0%	0.0%	0.0%	0.0%
liability for ships	0.1%	0.1%	0.1%	0.2%	0.0%
general liability	1.7%	1.7%	1.7%	1.6%	1.4%
credit	0.6%	0.4%	0.3%	0.2%	0.1%
suretyship	0.0%	0.0%	0.0%	0.0%	0.5%
miscellaneous financial loss	0.1%	0.4%	0.3%	0.6%	0.2%
legal expenses	0.0%	0.0%	0.0%	0.0%	0.0%
travel assistance	0.6%	0.6%	0.6%	0.7%	0.6%
life insurance and annuities	7.6%	7.8%	7.8%	6.4%	5.0%
marriage and birth insurance	0.1%	0.1%	0.1%	0.1%	0.1%
unit linked life insurance	0.2%	0.2%	0.3%	0.2%	1.7%
permanent health insurance	0.1%	0.2%	0.1%	0.1%	0.1%
capital redemption	0.0%	0.0%	0.0%	0.0%	0.0%
supplementary insurance	0.7%	0.7%	0.7%	0.6%	0.5%

Table 2: Relative share of insurers' premiums received through insurance brokers, by type of insurance

(Source: Bulgaria's Financial Supervision Commission)

However, the above table simply shows which products generate the largest volume of premiums for the insurers through brokers. From the point of view of the brokers, this is important as turnover is a primary factor in profit and value, but it is still not equivalent to them. Therefore, we also have to consider the percentage of commissions received by the brokers on these premiums (Table 3).

Table following on the next page

YEAR	2014	2015	2016	2017	2018
INSURANCE PREMIUM					
accident	***25%***	22%	***25%***	31%	***25%***
sickness	15%	14%	14%	16%	13%
land vehicles others than railway rolling stock	24%	24%	24%	27%	24%
railway rolling stock	22%	20%	19%	23%	19%
aircraft	8%	10%	8%	7%	6%
ships	12%	13%	12%	15%	13%
goods in transit	20%	21%	21%	24%	22%
fire and natural forces	24%	25%	21%	25%	22%
other damage to property	22%	16%	19%	30%	22%
motor vehicle liability	15%	15%	15%	19%	15%
aircraft liability	15%	7%	6%	***36%***	9%
liability for ships	9%	7%	8%	7%	9%
general liability	19%	19%	19%	26%	21%
credit	12%	15%	15%	15%	15%
suretyship	23%	25%	20%	20%	16%
miscellaneous financial loss	13%	7%	10%	11%	21%
legal expenses	20%	25%	25%	30%	35%
travel assistance	39%	39%	39%	44%	38%
life insurance and annuities	12%	15%	17%	23%	16%
marriage and birth insurance	21%	20%	25%	22%	17%
unit linked life insurance	19%	20%	18%	24%	4%
permanent health insurance	10%	14%	19%	17%	16%
capital redemption	14%	***25%***	0%	10%	18%
supplementary insurance	31%	36%	35%	43%	13%

Table 3: Commissions received by insuran Source: Bulgaria's Financial Supervision (Source: Bulgaria's Financial Supervision Commission)

4. FINANCIAL MANAGEMENT OF BULGARIA'S INSURANCE INTERMEDIARIES BEFORE AND DURING THE COVID-19 PANDEMIC

4.1. Executive summary

The challenges for insurance intermediation are associated mainly with the place and function of insurance intermediaries and their capacity to maintain or improve their market positions. Several groups of such challenges can be identified. First of all, there are challenges caused by changes in the general economic conditions in a country or region - economic growth, population's purchasing power, demographics, development inequalities. Outreville (Outreville, 2013) claimed that "economic growth is an explanatory variable among other factors that affect the demand". Indeed, it is logical that economic growth through the mechanism of growing aggregate demand should also affect the demand for insurance products and hence lead to a positive development of the entire insurance sector according to Outreville's "demand-following" model of interaction between insurance development rate and economic growth. In his publication, Outreville reviews more than 80 fundamental and more recent empirical papers on the relation between insurance and economic development to propose a "supply-leading" causality pattern, in which insurance development leads to economic growth. The roots of such a relationship can be found in new risk management methods that make entrepreneurs less risk-averse. Similar results are shown by the study of the G-20 economies of Pradhan et al. (Pradhan et al. 2017a). However, this relationship can have an adverse effect as well – a deterioration of the general economic conditions would result in a poorly developed

insurance and insurance intermediation sector. For example, in Bulgaria there is an unfavorable combination of some of these factors - depopulation of some regions, over-concentration of population in the capital city, low purchasing power and insurance culture of certain social strata. This makes it difficult for intermediaries to find clients and to maintain profitability. Sometimes these conditions result in an adverse causality between economic growth and the development of the insurance sector. The study confirmed this hypothesis stating that in developing economies, despite the efforts of governments to advance "adjustment" of the financial system as well as despite the fast overall economic growth, insurance remains underdeveloped. The second type of challenges are some changes in the financial system and in particular the insurance intermediation sphere, such as decreasing interest rates, tariffs, etc. There is, for example, a causality relationship between interest rates and the so-called insurance cycle (underwriting cycle) (Wilson, 1981; Doherty, 1998). For example, the global financial and economic crisis of 2008-2010 was followed by a wave of distrust of the financial system, but also by a wave of regulatory changes. Baluch, Mutenga and Parsons (Baluch, Mutenga, Parsons, 2011) investigated this and some previous financial and economic crises and found out that recessions affect the insurance sector in several ways. First, a crisis leads to more insurance events for risks underwritten by the insurance companies and thus to more claims and benefits paid. The elasticity of demand for general insurance is relatively low due to certain regulatory requirements for compulsory insurance (motor liability, etc.). However, as the general demand inevitably decreases, insurers are forced to reduce their premiums (soft market). Although the increase in life insurance benefits paid is not great, the demand for such products decreases, as well as the withdrawal and redemption of funds on the policies increases. An interesting aspect of the impact of the financial system and in particular financial crises on insurance intermediaries is their interaction with banks as a distribution channel. Currently this market segment is stagnant and banks are withdrawing from this type of "collaboration" with insurers, and vice versa - some leading insurers are withdrawing as bank equity holders. This is logical - as a result of the crisis, the pressure is primarily on banks and they have difficulty being partners of insurers. In recent years, however, it has been proven that this process does not have serious consequences and bank insurance continues to be a vital channel for distribution of certain products. For example, according to the European (re)insurance federation Insurance Europe (https://www.insuranceeurope.eu/insurancedata, 2019), this insurance sales channel was used for selling large relative shares of life insurance in some member states - 68.3% in Spain, 71.8% in Portugal, 76.9% in Italy, etc. Thus, the next type challenge are normative regulations. They also have dual causality - on the one hand, they "arrange" the market and restrict unfair competition, but on the other hand, they put higher barriers to penetration of new businesses. An appropriate example is the evolution of the normative regulation of insurance mediation in Bulgaria. The amendments of the legislation in force provided for stricter requirements regarding the activities of intermediaries - first a licensing regime was introduced, then a mandatory registration of brokers, followed by such registration of agents. Gradually, more and more requirements are introduced regarding the education level, qualifications, and professional experience of the persons entering the managing bodies of brokers and/or managing and directly performing the activity of insurance mediators. The same regulations apply to physical agents. With the latest versions of the Insurance Code, these requirements are extended to cover other categories of physical persons engaged in insurance intermediation - the insurers themselves when selling insurance products directly, and intermediaries performing insurance intermediation as an ancillary activity. All these changes are, on the one hand, a challenge to both existing and new entrants, but on the other hand, they bring order and security to the market, which is entirely in the interest of consumers. Regulatory changes often affect the unit price of insurance and deregulation can lead to lower premiums (Berry-Stölzle, Born, 2010), which modify supply, consumer demand

and inevitably affect the performance of intermediaries. There are also some challenges that are specific for the intermediary segment of the insurance sector. Such a challenge are the infamous contingent commissions which sometimes result in conflicts of interest regarding the activity of brokers. Generally, a contingent commission is a commission paid to an intermediary by an insurance or reinsurance company with a value dependent on the achievement of a certain goal, such as a certain risk level of insurance policies sold, a certain level of profitability, a certain volume of sales, etc. The closer the correspondence between what is achieved by the broker and what is set by the insurer, the higher the commission. On the one hand, these commissions can create a conflict of interest in the intermediary, giving him an incentive to direct clients not to the most beneficial insurer, but to the one who pays the higher contingent commission rate. In this context, they became infamous in 2004, when the New York Attorney General Eliot Spitzer filed a lawsuit against the five largest brokerage firms for their business practices, including for contingent commissions. It is believed that a significant number of insurers and brokers have reduced the use of this type of commission since then (Ju, Browne, 2017). On the other hand, according to some authors, contingent commissions are an important balancing element of the market, because they overcome the typical information asymmetry and more precisely that part of it that is to the detriment of the insurer (Cummins, Doherty, 2006). Yu-Luen Ma et al. (Ma, Pope, Xie, 2014a) examined this practice and its effects for the financial position of insurers with a focus on retrospectively paid commissions used in insurance to improve the compliance with the goals of insurers and intermediaries. The authors analyzed the financial efficiency of insurers who pay this type of commission and conclude that such insurers are not significantly more cost-effective and efficient than insurers that do not pay contingent commissions. However, among those who pay them, the insurers who have more of this type of agreements with their intermediaries are more efficient and perform better than the others. What is interesting in this case, is that the type of distribution channel used is important for the validity of these results. Insurers generally use channels of independent intermediaries (brokers and independent agents) who prefer contingent commissions, where the remuneration depends on their individual performance. Conversely, the performance of the brokers determines whether the large insurance companies would prefer to use their services if they are willing to be paid through contingent commissions. On a more global level, there are new types of risk caused by qualitatively new trends in social development (e.g. terrorism, climate change, digital and cyber risks), which give rise to new insurance products with unclear long-term effect, which in turn makes intermediaries uncertain regarding the promotion and distribution of such contracts. Changes in the insurance sector have the greatest impact on intermediation. Prodanov (Prodanov, 2017) points out three current trends that change the paradigm of insurance: (1) securitization in insurance and the transfer of insurance products to financial markets; (2) the Internet of Things concept; and (3) Blockchain technology and Smart Contracts. Quite naturally, insurance intermediaries would be most concerned about these channels because the Internet as a sales channel can help insurance companies increase the share of their direct sales and displace brokers and agents or force them to "mutate" in IT aggregators. Insurance securitization through insurance-linked (ILS) and risk-linked securities (RLS), on the other hand, challenge the insurance sector in general and threaten to displace the insurance function to the capital market. However, for brokers the threat may not be so great if they manage to adjust quickly enough in the new conditions and offer the same level of information and advice regarding these financial instruments as they do for insurance contracts. Historically, insurance intermediation has gone through similar vicissitudes and has survived, and rightly so. The reason lies mainly in the specific characteristics of the insurance products they sell and the fact that their quality can often be assessed only after their consumption (experience goods) and may not be assessed at all (credence goods). This means that customers will always need additional consultation services regarding the insurance they need.

Taking into account the inherent information asymmetry of the insurance market as well, we can confidently say that insurance intermediation will continue to play an important role in the sector.

4.2. Selection of inputs for managerial financial analysis and financial management of insurance intermediaries in Bulgaria

The underlying idea is that the aim of corporate financial management is to create value for the owners or shareholders of the company (Prodanov, 2012). It is always related to the market and the company's ability to sell its products on this market (Prodanov, Pavlov, 2016a). If this is expressed by means of the basic model for valuation of financial assets (2), it is obvious that to this end the performance of investments (i.e. the expected cash inflows E(CFt)) - E (CFt)) is combined with the weighted average cost of capital (WACC as a discount rate) to achieve optimality.

$$(2) \qquad V = \sum_{t=1}^{+\infty} PV[E(CF_t)] = \sum_{t=1}^{+\infty} \frac{E(CF_t)}{(1+WACC)^t},$$

where:
V is the value of the company;
PV[...] is its present value; $E(CF_t)$ is the expected cash flow at time t;
WACC is the weighted average cost of the capital of the company.

The analysis of the financial situation itself is always based on the macroeconomic environment for business operations, where the financial sector, public debt and deficit, and fiscal regulations (Nikonova et al. 2020) are crucial for the economic stability and growth (Zahariev et al., 2020f). No less important are the opportunities for building supply channels, whether it is the real sector of the economy (Laktionova et al. 2019) or the sector of financial and insurance services, where the relationship between insurance intermediaries and insurance companies is more than obvious. This leads to the following conclusions:

- Managerial financial analysis (Zahariev et al. 2015) is used by financial managers in their day-to-day activities related to investment (capital budgeting) and financial decisions;
- This analysis provides information for optimal solutions of the above management problems (Kostov, 2016);
- The optimization of financial and investment problems cannot be achieved without their integration into a single criterion (Kanev, Terziev, 2017a; Terziev, 2020a, Terziev, 2019b-d; Terziev et al. 2020b; Terziev, Georgiev, Solovev, 2020c-d; Terziev, Lyubcheva, Solovev, 2020e) for maximizing the company value.

Therefore, it is especially important to select factors that can provide objective grounds for decision-making by the financial management of the insurance broker and take into account equally well both the macroeconomic environment and the specifics of the concrete insurance broker. Thus, in the latest study conducted in 2020, in medias res of the COVID-19 pandemic, the following 15 key factors applicable to Bulgarian insurance brokers were identified and empirically tested: Total average household income; Average salary per household; Total average income per person; Average salary per person; GDP gross value added at basic prices; Harmonized CPI; Interest rates; Wholesale and retail sales of motor vehicles and motorcycles, maintenance and repair; Unemployed, percentage of active population; Corporate premiums; Total premiums; Premiums central office; Retail premiums; Premiums capital city; Premiums province (Zahariev, Stanimirov, Zdravkov, 2020h). All variables included in the model were tested by the authors for stationarity and adjusted to the test results.

Different configurations of each model were tested, and the model with the best indicators (Coefficient of determination, Akaike criterion, etc.) was selected. The obtained results are considered as applicable to the process of financial management of the insurance company both before and during the pandemic COVID-19 and included in models for forecasting the income of the insurance broker. The empirical testing with the selected set of factors applied to data for a leading Bulgarian insurance broker generated forecast values for the period 2019-2023 first for the exogenous variables and on their basis - the main target variables (Erusalimov, 2009). The figure below (Figure 1) shows that the model has an extremely high descriptive ability - for the historical period the two curves - the actual and the calculated - practically coincide. This gives grounds to accept the forecast part for further studies.

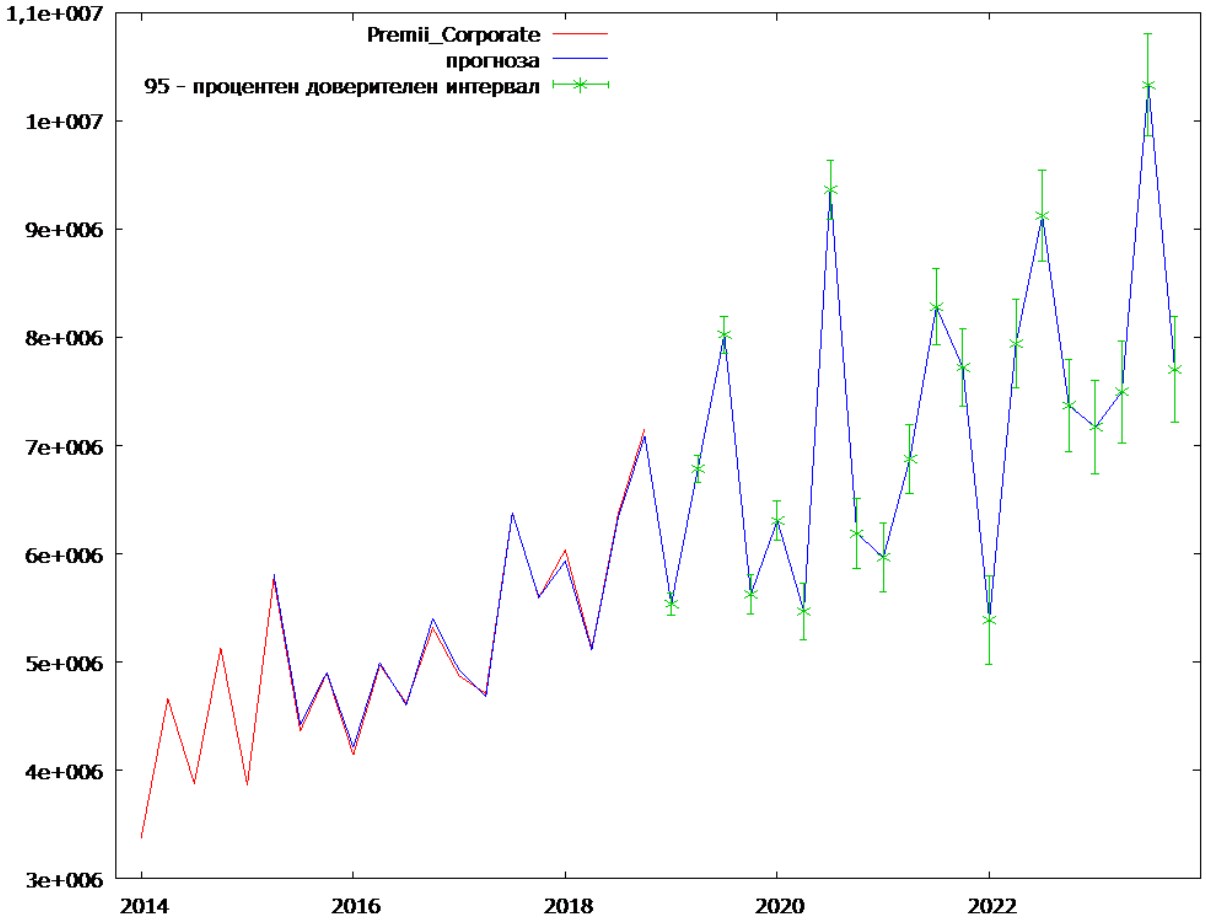

Figure 1: Premium forecast for corporate insurance brokers

Figure 2 (Zahariev, Stanimirov, Zdravkov, 2020) demonstrates similar results from modelling and forecasting of retail premiums. Therefore, it can be assumed that such models of the operations of business institutions exposed to risks (such as COVCID-19) of insurance events are objective and applicable as managerial financial model for insurance brokers. Once the monitoring and forecasting factors have been identified, the financial controlling model of the insurance intermediary can be applied with an emphasis on conservative scenarios for development, avoidance of excessive risk exposures (Krastev, 2019) and setting of financial and non-financial goals. Of course, all this depends on the human factor in intermediary companies, which, especially in an environment of international business expansion, have to solve not only staff selection problems, but also the problems related to staff motivation, retention, and fluidity (Zaharieva, Sylqa, 2020g).

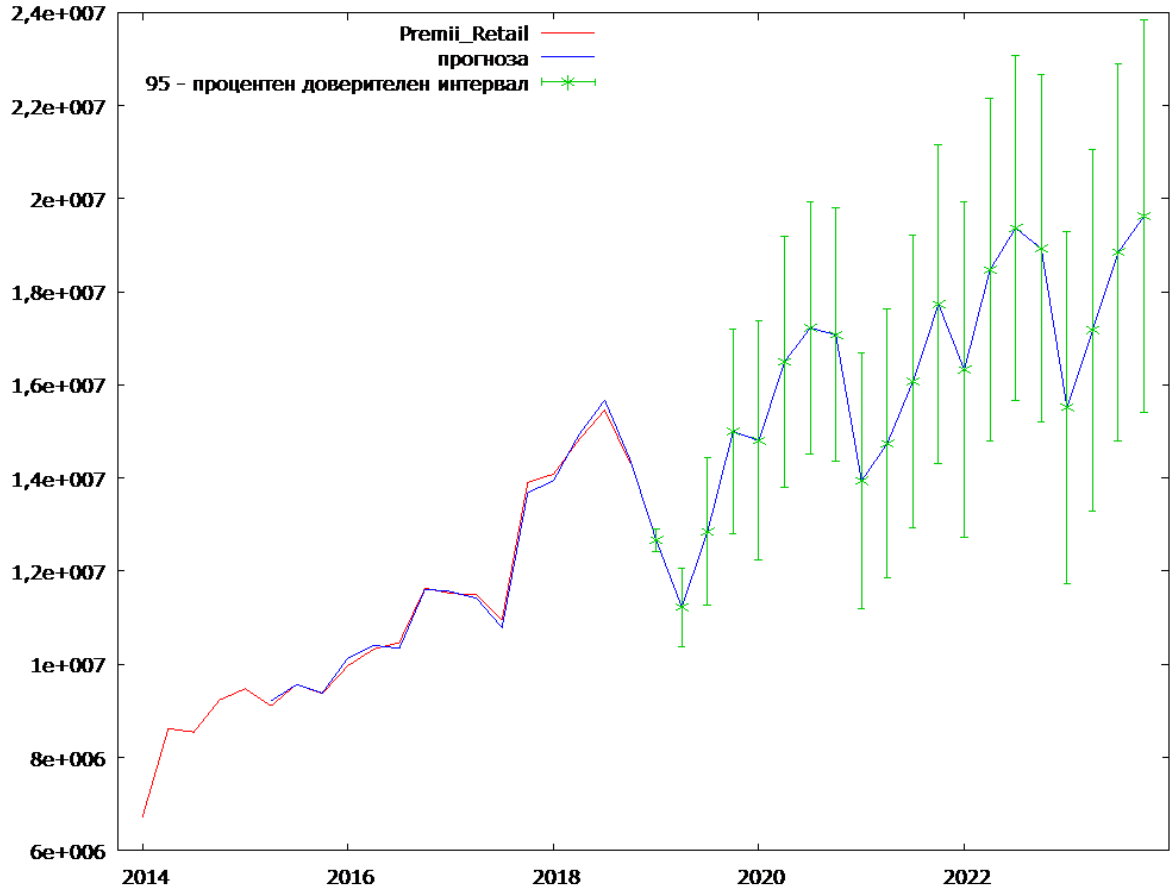

Figure 2: Premium forecast for a retail brokerage insurance broker

Thus, by integrating financial and human capital, the specific and strictly professional intermediary business of the insurance broker has its chance to survive in the critical pandemic environment of COVID-19.

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ACHIEVED RESULTS OF THE BULGARIAN PROSECUTOR`S OFFICE IN THE PROSECUTION AND INVESTIGATION OF CRIMES OF CORRUPTION

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ABSTRACT
The Bulgarian Prosecutor's Office shall ensure that legality is observed by bringing charges against criminal suspects and supporting the charges in indictable cases; overseeing the enforcement of penalties and other measures of compulsion; taking action for the rescision of all unlawful acts and for restoration in urgent cases of unwarrantedly exercised right, contested also by another; taking part in civil and administrative suits whenever required to do so by law. The main activity of the Bulgarian Prosecutor's Office, prosecuting and bringing charges against specific individuals, is unthinkable without the operational capacity of the executive bodies. In exercising its powers of detecting a specific criminal activity, it is necessary to establish a number of data, which will then be collected as evidence and verified in the course of criminal proceedings. This activity is worth much by detecting crimes of corruption.
Keywords: *Bulgarian Prosecutor`s Office, Progress, Activity, Positive Results, Good Practices*

1. INTRODUCTION

As repeatedly pointed, the corruption is one of the main priorities of the Prosecutor`s Office in recent years. Our activity, however, is a small part of the whole process of counteracting such kind of criminality – our activity is limited to criminal prosecution, under the current legislation, of the persons who have committed the corruption crimes, as well as to the minimum degree of prevention by supervising the legality. Decreasing the corruption level, not only in our country, but also in Europe and worldwide, is a task and a challenge for every country. The criminal proceedings themselves cannot eradicate this phenomenon, which is impossible without the political will for tackling corruption, effective interaction between the judiciary and the executive and an adequate legal basis.

2. THE CHALLENGES TO THE BULGARIAN PROSECUTOR`S OFFICE

One of the most significant results of the recent years reforms, carried out in the field of anti-corruption, is the transfer of high level corruption cases from the territorial district courts and prosecutor`s offices, respectively Sofia City Court and Sofia City Prosecutor`s Office (having in mind their special competence under Art. 35, para 3 of the Criminal Procedure Code) to the Specialized Criminal Court and the Specialized Prosecutor`s Office as. As mentioned above, we share the opinion that creation of specialized jurisdictions is a good working European practice, giving positive results, including in our country.

In this way, firstly the dependences were overcome at local level, within which quite often most corruption cases against municipality and district mayors were finally resolved, as well as the corruption risk among magistrates was significantly reduced. Secondly, a legal framework was established under which bodies specialized in resolving the most serious cases in the country, organized crime and terrorism, shall consider also corruption cases that are of no less public importance. This facilitates the possibility of forming a sustainable practice, which in turn would speed up the criminal process. In this way the recommendation contained in the Independent Analysis of the Structural and Functional Model of the Prosecutor`s Office and its Independence, carried out in 2016 by the EU Office for Technical Support, was implemented, namely: to transfer corruption cases to the Specialized Criminal Court, "where there is more constructive interaction between prosecutors and judges and less formalism". It is a common opinion amid the legal community in our country that the very formalistic Criminal Procedure Code needs to be amended (even to be revised), while the Criminal Code dated 1968 need a complete revision in order to fully reflect the contemporary phenomena and trends in criminality. This opinion is to be found also in the Report on the Independent Analysis of the Model of the Prosecution in 2016, highlighting a number of other shortcomings of the current substantive and procedural criminal law, which hinders not only the detection of corruption crimes but also conventional crime in general. For example, the results of "preliminary inspections", in cases where the signal submitted by a citizen or an organization does not contain sufficient evidence of a crime, have no procedural value in the course of criminal proceedings. Therefore, it is necessary to repeat all these preliminary actions in the course of the criminal proceedings, but performed through the means of proof provided for in the Criminal Procedure Code and in compliance with the procedural guarantees provided in it that in many cases are unnecessarily formalistic. This greatly complicates the procedural activity in terms of the amount of evidence gathered in the course of the investigation, due to which the two-month investigation period provided for in the law (although with the option to be extended many times), seems unrealistic. Another example of increased formalism in terms of procedural rules is the impossibility for public statements of guilt expressed by a particular person to have probative value before the court. There is also an opinion and recommendation, given again by the experts who carried out the independent analysis of the structural and functional model of the prosecution, for a comprehensive revision of the principle of decision-making according to internal conviction by prosecutors, which the experts believe should be amended, especially what concerns the Prosecution. It should be noted that in case the current legal situation remains unchanged, it is very likely that organizational methodological measures will be taken and that the relevant instruction will be issued, which will give clear guidelines on the application and interpretation of Article 14 of the Criminal Procedure Code. Another extremely serious problem for law enforcement, related to the formalism of the Bulgarian criminal process, is the content of the indictment, which is the final prosecutorial act by which the case is submitted for consideration to the court. On this issue, some measures were taken at the legislative level to simplify it, but the established practice continues, the content of the indictment to be so detailed in fact that it is as if the prosecutor who prepared the indictment was a witness, an eyewitness to the crime. This situation is a function of the excessive guarantees that the Criminal Procedure Code provides for the right to defense of the accused. We fully support the recommendation pointed in the Independent Analysis of the Structural and Functional Model of the Prosecutor`s Office, that the content of the indictment should contain, in the shortest possible and synthesized form, the circumstances related to the crime, as well as the institute of the so - called substantial procedural violations should be seriously revised. We consider that the current provisions of the Criminal Procedure Code dealing with indictments create problems not only for the effectiveness of prosecutors, but also for the effectiveness of the entire criminal justice system.

Compared to other EU member states the indictments in our country require unnecessary details. In order to be comprehensive, it should be noted that even in cases with a high level of public interest (that should not be subject to unnecessary delays) it is common practice for judges to return cases to prosecutors due to minor omissions in the preparation of the indictment, which is quite possible to be removed during the trial phase of the process. We should mention here some positive legislative amendments, facilitating the trial phase. For example, it is no longer necessary to read the indictment before the court, a copy of which the accused person has at its disposal before the court hearing and the content of which the accused person was obliged to get acquainted with. Instead, an obligation was introduced for the prosecutor to present to the court a summary of the facts of the indictment, determining the criminal liability of the particular defendant. Thus, another one of the recommendations of the experts carried out the independent analysis was implemented. There are also a number of problems with the Criminal Code, especially with regard to the fight against corruption. Currently, in our criminal law the provocation to bribe continues to be criminalized. Taking into account the specific objectives that the "parties" pursue in the giving and receiving of the respective benefit, we believe that this text of the Criminal Code completely undermines the course of almost any criminal proceedings with such an object of investigation. The provision itself was adopted in 2000, in a historical period accompanied by numerous corrupt practices, mostly related to the privatization of state property, and high levels of corruption risk. That is why we find that if, political will for tackling corruption is in fact to be demonstrated, a mandatory step in this direction is the decriminalization of the provocation to bribery. We also find that the state should apply a complex and differentiated approach to the individualization of the punishment of persons who have committed corruption crimes. In this regard, legislative changes are needed to ensure the wider use of accomplices and other participating defendants (through agreements, if necessary) against the person who committed the corruption offense in question (giving them the opportunity to be prosecuted first or to be granted immunity). Of course, we also take into account the need to fully guarantee the protection of their physical integrity, given the risks that arise as a result of their assistance to law enforcement agencies. In this sense, is also one of the recommendations of the Independent Analysis. It is necessary to be given a new meaning to the Art. 282 of the Criminal Code / malfeasance /as the violation or abuse of official duties do not apply to the officials in the trade companies, and the corruption crimes need to cover the private sector as well. In the same way, we believe that it makes sense to adopt provisions that criminalize the commission of the criminal act itself, without the need to prove any harm caused by the breach of the procurement rules. It is necessary to introduce a legislative mechanism according to which seized illegally acquired assets should be "reinvested" for the purposes of criminal proceedings or to compensate the victims of the crime. Such a mechanism exists partially, with regard to citizens and legal entities, through the figure of the "civil plaintiff", but in cases of corruption offenses, for example, there is no mechanism by which the subject of the crime - the material benefit seized to the benefit of the state to be used for the purposes of forthcoming criminal proceedings (Terziev, Bankov, Georgiev, 2018-a; 2020).

3. CONCLUSION

As a contribution to the reforms for counteracting corruption should be mentioned the improvement of the legal basis in the field of securing and seizure (confiscation) of illegally acquired assets. In accordance with the requirements of Directive 2014/42/EU of the European Parliament and of the Council of 3 April 2014, definitions of "direct and indirect benefit" were introduced, fully covering the definition of "benefit" under Art. 2, item 1 of the Directive (Art. 53, para. 3, point 1 and point 2 of the Criminal Code), the possibilities for confiscation of property were expanded (Art. 53, para. 1, item "a" of the Criminal Code) and an adequate

mechanism was created for management of secured assets until its subsequent confiscation, seizure according to an effective judicial act. The use of the procedural methods for application of the protective measures under Art. 72 and Art. 72a of the Criminal Procedure Code (freezing of property) guarantees the actual execution of property sanctions (fine, confiscation, seizure to the benefit of the state). The normative and structural changes allow to effectively implementing the interaction with the Commission for Combating Corruption and Confiscation of Illegally Acquired Assets in the implementation of the activities under Chapter Nine by the bodies under Article 16, para. 2 of Anti-corruption and Illegal Assets Forfeiture Act and the management of the property in respect of which the measures were applied (Terziev, Nichev, Bankov, 2016-a).

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