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INFORMATION AS A MARKET PRODUCT AND INFORMATION MARKETS

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Abstract

Information is a key category in a modern society and in the modern economy that is largely based on knowledge. Information has always been a basis of decision-making processes, starting with the preparation phase (planning) through its making, up to the accomplishment of the pre-set goals.

One can probably agree that information is a specific good which also has the ability to fulfill certain consumer needs. Moreover, information plays many essential functions in the economy, especially an informative, decisive, controllable, and consumable functions, just to mention a few. All of these functions influence on the volume of information demand and supply.

The aim of the article is to analyze the role of information in today's economy as well as to scrutinize its main functions as a basic significant element, as a basis of human communication, as an economic resource, and as a product bought and sold on the market.

Keywords: information, market product, knowledge economy, consumer choice, information markets

JEL classification: D83, D89

Introduction

Information is a key category in a modern society and in the economy based on knowledge. Civilization changes lead to the transformation of social structures and the ways of accomplishing procedures of managing in such a way that a creation, processing and using information decides about final effects of human actions and appearing between people social and psychological relations (on the basis of the Becla et al., 2010; Gałka et al., 2016).

The term information is difficult to define, especially if we want to combine precision with appropriate capacity (notional range).

Since the notion of information is a key category in the below considerations, the attempt to define it is unavoidable. For further considerations, information is the flow of data or truths formulated in the sequence of signs of a certain language from the sender to the receiver. Information understood in such a way has a few attributes, which refer to it as well as to the process of gathering, processing and transmitting it and, in a sense, using it.

Firstly, information as a sequence of signs should be comprehensible, which means that it has to be the sequence of signs distinguished in a certain language. If this condition is not fulfilled then, from the semantic point of view, such a sequence of signs has no informative meaning since it does not serve any of the before mentioned functions.

Secondly, information always occurs with its carrier. It can be any physical form of matter or energy perceived by senses or appropriate instruments which transform it so that it could be

perceived by senses. No information exists apart from its carrier. From this point of view, the appliances or biological sensors receiving and processing sequences of signs are crucial. The more precise they are (at receiving or processing), the more useful the acquired information will be.

Thirdly, information makes sense only when there are its sender and receiver. If the two parties are aware of the mutual process of communication, the information sent between them has the nature of a *message*. If, however, the only party aware of reception is the receiver of information, then it has the nature of *news*. This situation takes place in the process of cognition of the surrounding reality by a man.

Information has always been basis of decision-making processes, Beginning with preparation phase (planning) through its making, up to accomplishment. In the conditions of information society and economy based on knowledge, information becomes a condition and a barrier of decision-making processes, it creates a new product and is a factor of production, it creates material and immaterial elements of socio-economic infrastructure. It means new challenges and requirements for a modern man.

The aim of the article is to provide information, as constitutes elementary significant element, as a basis of human communication, as an economic resource, as a market product.

Defining information as a market product

While analyzing the role of information in the economy and society it can be seen in a few different dimensions such as: economic resources and production factor, a product or commodity, the infrastructure of economy and public good. Information in every acquired form fulfills the conditions of economic resources. Many attempts to define the term “economic resources” can be found, as well as, to classify the types of such resources. One of them says that “*economic resources are all the forms of reality which can be used in management*” (Czaja and Becla, 2007, p. 42), and forms of such resources are information resources, thus gathered knowledge. Economic resources consist of:

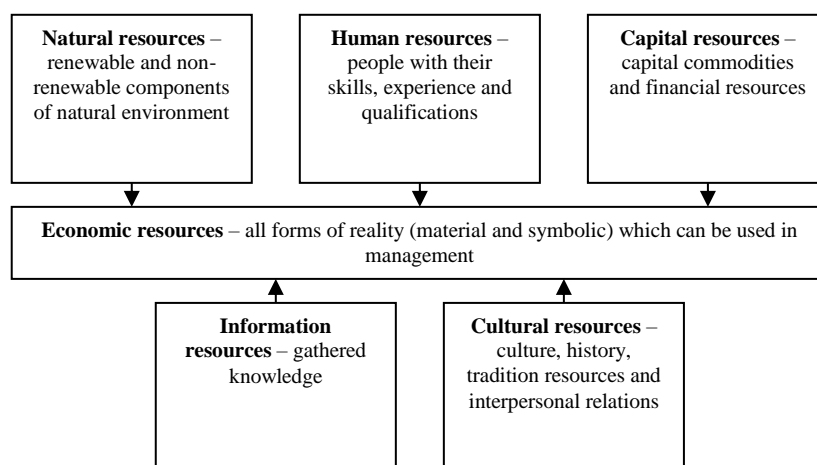
- 1) human resources which embrace people along with their skills and suitability for performing work;
- 2) material-monetary resources, which embrace objects supporting the process of human work (tools, appliances, buildings, constructions, and other elements of technical-economic infrastructure), also financial assets and money;
- 3) information resources which embrace individual and social knowledge;
- 4) environmental resources which create components of natural environment of renewable and non-renewable nature;
- 5) cultural resources made of symbolic elements of culture, tradition and human relations.

Nowadays, it common to distinguish resource and capital approaches. Economic resources can be treated as deprived of time dimension “resources” or “streams”, with clearly defined time dimension (Czaja, 2010, chapter 2.1). In the first case, the problem of limitation (physical finiteness) and rarity (greater than oneness relation between the amount of a given resource which is in demand and in supply). The second, much more important problem, concerns the flow of streams and the ability (conditions) to reconstruct them. The attribute of reconstruction may be used as the element useful while identifying the notion “capital”. Capital would be such an element of economic resources which characterizes the ability to reconstruct. It could be connected with the phenomenon of wearing a given resource in time in the process of management and the process of restoring physiochemical properties or symbolic allowing for

using them in subsequent processes of management. The wearing of capital elements in the process of management is in accordance with the law of entropy (information rate), which decides not about annihilation of certain reality elements (especially material), which the first law of thermodynamics does not allow to do, but about the direction of their transformation (conversion) according with the time arrow from low information rate forms which are useful for the man (thus the loss of anthropogenic utility). The problem of wearing is the issue of losing the utility for the man and not the actual disappearance of a given element of economic resources. An interesting issue is the phenomenon of the pace at which the elements of capital wear under the influence of their purposeful use by the man or uncontrollable natural processes (like corrosion) (more on this issue can be found in Czaja, 1997).

Economists find the issue of restoring capital resources more interesting. Restoring processes may be linked with intentional human activity or stay beyond it. Restoring concerns the size of utility value and its quality. It applies to human resources, anthropogenic capital, financial capital, intellectual capital, natural capital or social capital.

Diagram 1: Classification of economic resources



Source: Becla et al. (2010), p. 25.

Two essential issues arise here. Firstly, how to measure the information resources used in the production processes. There are, however, certain quests in literature, but a satisfactory measure has not been obtained. Secondly, there is still the issue of how to isolate the influence of that information which decides about, for example, the “yearbook” of capital or human capital.

While being the production element, information becomes a product which can be sold (or purchased) on the market. It is not a matter of information constituting public knowledge. It does not constitute the object of trade exchange. A considerable part of knowledge is subject to protection under the copyright law and is (may be) the object of trade exchange. Information is a specific good which has the ability to fulfill certain purchaser’s needs. Its specificity is connected with particular properties, namely, information consumption does not cause considerable physical wearing of information. Currently, information may be copied almost infinitely. Apart from that, information can be, at the same time, substitutable and complementary in relation to other information and economic resources.

Oleński (2001) distinguishes as many as seven features differentiating information as the product from other makes and services, though the information itself he treats as a make or service. They are as follows (Oleński, 2001, chapter 4):

- 1) information can be easily and cheaply popularized;
- 2) information durability as a product is dependent on the type of information carrier;

- 3) material carrier has an influence on the process of semiosis, in particular on the reception and interpretation of information by the users;
- 4) there is no satisfying criteria of quality evaluation of information as a product;
- 5) the user/receiver, only after receiving information, can evaluate the utility of this product (the syndrome of “buying a pig in a poke”);
- 6) information production is mass production and more commonly standardized;
- 7) nowadays, information as a product realizes mainly controlling and consumptive functions; however, the function of reality mapping recedes into the background; often while producing such information this last function is deformed.

Information as a product becomes a commodity when it is the object of a transaction on the market. A market transaction, as it is known, means the conveyance of property or beneficial interest in relation to an object (service) from one subject to another. Certain characteristics which set specify also for the commodity – information, are also noticed. Firstly, in the case of information, property rights (beneficial interest) concern also an information carrier. Secondly, information causes problems with the protection of the property right (beneficial interest) and generates significant costs within this range. Thirdly, the transaction of acquiring information takes place in information asymmetry, which is reflected by the syndrome of “pig in a poke”. The offeror knows what he is selling, the buyer does not. As a consequence, the *ex ante* of utility value of the acquired information cannot be evaluated. Also, information quality cannot be predicted. Concluding information transaction, similar to any form of economic activity, is connected with uncertainty about the quality of information and the partner’s behavior in the exchange.

Information, actually the set of information (knowledge), is an essential part of the socio-economic infrastructure in a given economy or community. Infrastructure can be recognized as all the information resources and functioning information systems which influence and often simply decide about the possibilities of using other economic resources (capital) and about existing and developing social-economic-natural systems. While treating information as an element of social-economic infrastructure of a given economy, it must be remembered that the information infrastructure of a given economy constitutes an element of global information resources and information systems. The relations between information infrastructure in the local and national scale, or global are similar. This can be enabled by modern information technologies. Information can also be treated as a public good. This issue is particularly essential when it comes to ecological information which is managed at the level of the local community and commune. Public good has a few important features which distinguish it from other types of good. It includes: bringing distributable benefits, possibility of consumption of non-emulative nature and lack of possibility of excluding anyone from the process of consumption or rationing the supply. Ecological information and other chosen groups of information fulfill the abovementioned conditions (attributes) of public good. It publicizes in the form of diffusion – automatic or forced (Czaja and Hałasa, 1997, pp. 84-85). Managing information of public good nature is an interesting but also a difficult task, both in theory and in practice. We will come back to it in further parts of this work.

Information serves many essential functions in economy, especially informative, decisive, controllable, and consumable. All of them have influence on the largeness of information demand and supply. The information market is governed by the same rules as the other markets. The power of demand and supply enable to shape equilibrium price and equilibrium quantity. Such typical behavior of the market concerns information which is in demand by many competing entities and information is offered by competing offerors. The nature of those information markets where entities searching for specific information (e.g. technological knowledge) and

offerors are protected by copyright (patent law) is more negotiating. Then the functioning of the market resembles functioning of auctions where the bids are made.

Acquiring information can be beneficial for the managing subject (decision-maker). It applies both to the information which is the subject of transaction on the information market and the information acquired from the non-market sources. It has to be remembered, however, that the information utility is strictly correlated with who is receiving it, how it is utilized and when it is received. Time is a very important aspect in the process of utilizing information and its utility for the receiver. Information may be lost in the process of forgetting and its too late receipt lowers its utility, and in some cases it makes it useless.

The abovementioned features do not limit information's significance as an economic good. The necessity of bearing the costs of acquiring, assimilating and using information forces the subjects searching for information to keep an account in this scope, whereas the offerors are forced to lower the cost of creating (preparing) and selling information. Market transactions concern the information which is not public good and additionally its utility for the buyer is higher in the situation of exclusiveness of given information use.

Information markets

The demand for information and the possibility to provide it will influence the creation of information markets. Such a market is specific when compared with other markets; on the other hand, it is governed by the same laws (rules) like other markets. The basic distinguishing feature is information asymmetry and the syndrome of "pig in a poke". The asymmetry is expressed by the advantage of the seller, who knows what he is selling, and the buyer's lack of knowledge.

There are a few features of the "pig in a poke" syndrome. Firstly, the buyer does not know what he is buying. Secondly, the object of market transaction is the information whose property rights means transferring a material carrier of the information. Thirdly, the transactions made are of high risk. The buyer is unable to evaluate the information utility *ex ante*, especially its relevance and pertinence. He can only do it *ex post*. The seller, however, does not know how the information will be used. In order to avoid illegal copying and publicizing of the information, this information which has particular value is offered not as a product, but as a service. Fourthly, the price of the product (information) is often strictly correlated with the costs. Fifthly, the buyer's needs are not always defined explicitly and the product is evaluated on the offeror's (manufacturer's) evaluation. The demand for information becomes the demand for news, information services and access to information. This demand is characterized by very high flexibility, singularity, brevity or many a legal regulations. Also such demand often succumbs to atrophy, modification or appearing. This demand is determined by a few basic factors like: (1) information needs of the users, (2) the scope of substitution between users' information resources and offered products, (3) the complementarity between information and other products, (4) a produce or information service price or (5) potential information user's income. These are, therefore, typical factors for every market. Information supply is shaped by factors such as: (1) the demand for information, (2) the reproduction of information, (3) information processing or (4) the possibility to map social or economic events.

The tendency to create such markets will be stronger so as to help reduce transaction costs and production costs. Three types of information markets have been distinguished:

- markets for long-lasting information, which can be treated as investments leading to reducing production costs; these markets include license, patent or software markets and educational service markets;
- markets for short-lived information, which are useful especially when making current decisions; these markets include markets of broking and consultation services, markets of

- testing journals or markets of confidential information (industrial espionage and economic intelligence units);
- markets for information acquired for self-satisfaction.

The above markets function according to different patterns. Often they are markets that represent complete monopolies. Such a situation occurs in the case of those information markets for which fixed costs of acquiring and processing information are high, whereas final costs of popularizing information are relatively low. Markets where costs of gathering and processing information are low are more competitive in nature.

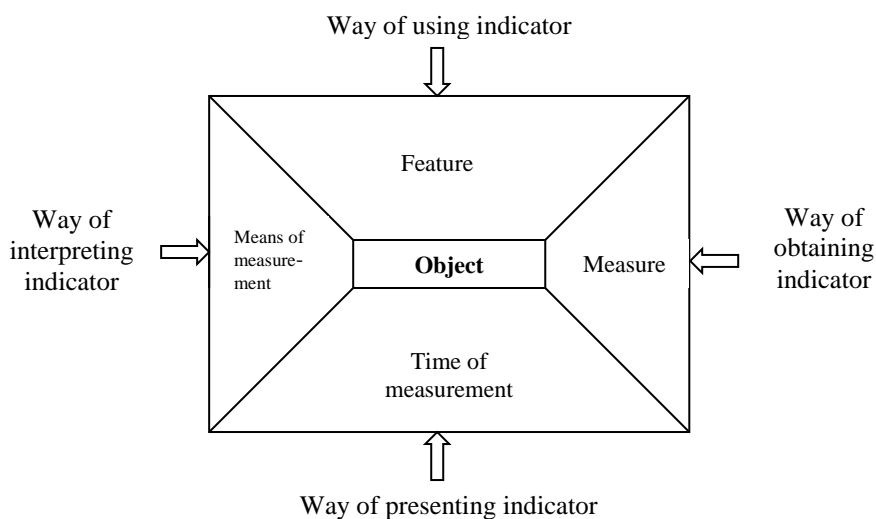
Entities in the information market will be driven by the principle of profit maximization. Depending on the level and intensity of competition on a given market, these entities will have at their disposal smaller or greater scope of influence on the product (information) price. The offeror will be able to use different forms of price discrimination on the monopoly information market.

The problem of business entities' behavior can be seen more widely through the prism of the concept of absolute knowledge. This notion is understood as the set of all possible information. It is a purely theoretical notion since every subject's knowledge is imperfect. In such conditions, a business entity will actively take steps in order to enlarge the resources of its own knowledge and other entities' knowledge. Information activity of this type can be different in nature. A few important issues determine the nature of information activity. It is essential whether entities are on the same side (then as rivals) or on the opposite sides (as partners in transaction) of the market. It also has to be remembered who initiates information activity, thus who plays the active and who plays the passive role, who is better and who is worse informed? An active buyer stocks up information, an active offeror transfers information.

The wish to get advantage over other participants of economic life is a strong determinant that stimulates active search for information. Information is both a condition necessary to realize production and consumption processes, and a factor which increases their efficiency. This latter aspect causes very high "information" saturation of contemporary economic enterprises. Being in possession of certain information gives the owner the advantage over other participants of a market game. Information becomes a good of high economic effectiveness and more often it becomes the object of monopolization or legal protection. Thus, the assumption in the model of perfect competition about the existence of access to complete information without bearing any costs is entirely unrealistic, even if we restrict it to information minimally indispensable for the subject to realize their purpose functions.

There are significant determinants which determine searching for information on the demand and supply sides of the market. When we look at information supply these have to be taken into account: the quality of information, the scope of advantage resulting from its absorption, the greatness of investment necessary to acquire and use the information, and the scope of information utility for other uses apart from the basic. From the demand point of view the profitability of information and its durability in time and the relation between income from its usage and alternative usage are not unimportant.

The possibility of limiting uncertainty in the company's functioning surroundings is also a strong stimulant which inclines economic entities to actively penetrate information sets and acquire them. Uncertainty is an indispensable feature of functioning of all the economic entities, which is connected both with the probabilistic nature of the surrounding reality and insufficient subjects' knowledge about the environment. If, in these conditions information is an essential factor reducing the uncertainty of the environment, then acquiring it (or the desire to acquire) is the resultant of a specific cost-benefit analysis, where the comparison is made between the income from the reduction of uncertainty and the costs of acquiring information.

Diagram 2: Characteristics and dependencies of an indicator

Source: Becla et al. 2010, p. 29

The form of information which is useful for the decision process often adopts the form of an indicator. The indicator can be represented by five determinants – object, measured feature, unit of measurement, time of measurement and means of measurement. This characteristic is in accordance with previously presented concepts. These elements have essential influence on the way of presenting the indicator, way of acquiring it, way of interpreting it, and way of using it (Zielińska, 2014, pp. 466-474; Zielińska, 2011a, pp. 87-96).

From the process management point of view, it is more important how this indicator is acquired, presented, interpreted and used. They have influence on the costs actually borne and on those which were avoided or possible to avoid, on the results and possible to achieve benefits. These values are used in the cost-effectiveness calculation (Zielińska, 2011b, pp. 112-119).

Conclusions

Information since the existence of human race has been a basis of its evolution success. Human brain occurred to be evolutionally the best organ to gain, gather, and process and use information. Information itself, particularly its most developer form– knowledge, used to give *Homo sapiens* not only a possibility for satisfying daily needs, but also it pointed the directions of civilization development. In the result of that a human being achieved the stage of information society together with the economy based on knowledge. In such a situation information became a basic factor which determines the directions, pace and the range of socio-economic development. It concerns each accomplishing strategy of such kind.

Information society means a situation of an easier access to information but also the increase of the quantity of generated information. As the research carried out in many centers in the whole world shows, a rapid spreading of information space does not go together with a Fast development of the methods (techniques) of searching sets of information and efficient use of information in practice. In the result, a dangerous situation appears, in which a human being (society or local community) is not able to „filter” extensive sets of information.

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