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Kontakt/Contact

ZBW – Leibniz-Informationszentrum Wirtschaft/Leibniz Information Centre for Economics
Düsternbrooker Weg 120
24105 Kiel (Germany)
E-Mail: [rights\[at\]zbw.eu](mailto:rights[at]zbw.eu)
<https://www.zbw.eu/econis-archiv/>

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Closing gap between new development and Voice of Customer

Mercedes Grijalvo* • María Fernanda Eliopoulos • Gustavo Morales-Alonso

Dpto. de Ingeniería de Organización, Administración de Empresas y Estadística, Universidad Politécnica de Madrid, Madrid, Spain

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Abstract

This paper defines a methodical and systematic framework that can be used by organizations seeking how to identify new products and markets and create customer value. In order to use a systematic tool and a robust method, Six Sigma's DMAIC methodology is applied. Previous research has contemplated it within manufacturing industries, but this research tries to explore within a business context, where little investigation is found. In order to conduct the investigation, a company-based study is followed, and two research paradigms are explored: Positivism and Interpretivism. The research begins with the exploration of New Service Development (NSD) processes, followed by the collection of the Voice of the Customer (VOC), then the linkage between internal activities and customer requirements are compared.

Keywords: New Service Development (NSD); DMAIC Six Sigma; Critical To Quality (CTQ); Voice of the Customer (VOC); customer satisfaction

JEL Classification Codes: L15, M11

1. Introduction

Developing long-term relationships with customers is mandatory for the evolution of companies' service providers. This relationship is grounded in the understanding of customer priorities, and from the development phase onward, the process should be devoted to understanding customer needs and requirements. For this reason, and to remain competitive, service firms are giving more recognition to service quality concepts. It is no longer enough to satisfy customers, but understanding them, which requires a considerable effort from all the members of the supply chain, from development to delivery. This requires implementing a shift focus from reducing defects and cutting cost to growing an organization's market share by identifying targeted products and markets and creating real customer value (Reindenbach and Gooke, 2006a). In current

* Corresponding author. E-mail: mercedes.grijalvo@upm.es.

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times, value at the point of production does not necessarily equate to value at the point of consumption, primary processes in the factory are only a small fraction of the total business processes (Womack and Jones, 2003) and value definition should not be internal, engineering-based, but driven by market, end-user (Reindenbach and Gooke, 2006b).

Considering the background of the problem, the following questions are proposed to guide the research and are complemented with the following addressed subtopics that are in line with New Service Development (hereinafter NSD) management: Which are the Critical to Quality (hereinafter CTQ) dimensions that drive customer satisfaction in the telecommunications wholesale industry? Which are the most CTQ activities in the Service lifecycle? And, once variables and activities are recognized, where are the gaps between the services developed by the company and the real Voice of the customer (hereinafter VOC)?

These objectives focus on exploring the process of developing new services for a better recognition of gaps between developed services and market needs and, at the same time, understanding purchasing priorities of customers when selecting a service provider, to translate the VOC into measurable CTQ drivers. Once all the information is gathered, the main focus is to analyze the linkage between the current NSD processes, against the CTQ drivers, to pinpoint performance gaps.

Over the years, many methodologies have been developed for process optimization including Taguchi method, six sigma, lean manufacturing and others. Each of these classes of approaches has a specific focus in probabilistic analysis and/or optimization (Koch et al, 2004) but all of them share the same philosophy (Karna and Shai, 2012). This scientific research is conducted through DMAIC methodology from Six Sigma. It provides a customer focused, well defined methodology supported by a clear set of comprehensive tool for process improvement (Tjahjono et al, 2010, Abid et al, 2020), the main objective for New Service Development process, and is a commonly applied methodology to achieve customer satisfaction by linking the VOC with an understanding of Critical to Quality factors (Den Boer, 2006).

Literature on Six Sigma is still scarce within a business context (Alsmadi et al., 2012, Biswas, 2011, Hamza, 2008) since it focuses mainly on manufacturing process to reduce defects and cut cost. This paper shows how Six Sigma can be implemented as a strategic tool to measure value, value opportunities and value management strategies from a customer value-driven approach (Huber et al, 2001, Khalifa, 2004). VOC drives decisions and identifies which people, products or processes should be targeted for improved value delivery (Found and Harrison, 2012, Narula and Grover, 2017, Martínez-Martínez et al, 2018). Customer value replaces customer satisfaction as a driving metric. As customers compare the value propositions of different competitive suppliers, they are drawn to the supplier that can give them the best quality (broadly defined) at the best price. This is a cognitive decision, based on evaluation, and not an affective decision (Reindenbach and Gooke, 2006b).

In order to conduct the research a company-based study is followed (Yin, 2009), and two research paradigms are explored: Positivism and Interpretivism. For the researcher, the chance to observe as a member of the company, and produce subjective qualitative data, gives the study an interpretive characteristic. Additionally, for abduction approach, the researcher moves between theory and reality, documenting the NSD process from the end user, and gathering empirical data on recent and previous projects.

Hence, the structure this article follows DMAIC methodology used in Six Sigma projects, starting with the DEFINE phase, to explore the life cycle of new services and to understand the structure of NSD processes in the company. Afterwards, the MEASURE phase produces an assessment of the current state which, along with CTQ Factors, is fundamental in identifying in the ANALYZE phase of areas of IMPROVEMENT within the NSD process. Finally, research includes a final CONTROL phase before the final conclusions.

2. Empirical research

This research study is conducted in the Telecommunications Group (TG) a leading organization in the Spanish industry with a broad participation worldwide. The area where this study is performed, is the Telecom Wholesaler (TW) and a part of the group (TG). The research analyses the gaps between the services developed by TW and the services requested by the market. The sources of the empirical study have been:

- primary data from the author's observations, data collected interviews with TW's personnel and validated with internal information and market researchers found in the company's knowledge network portal
- secondary data from TG and TW Intranet and website, and manuals and project documentation.

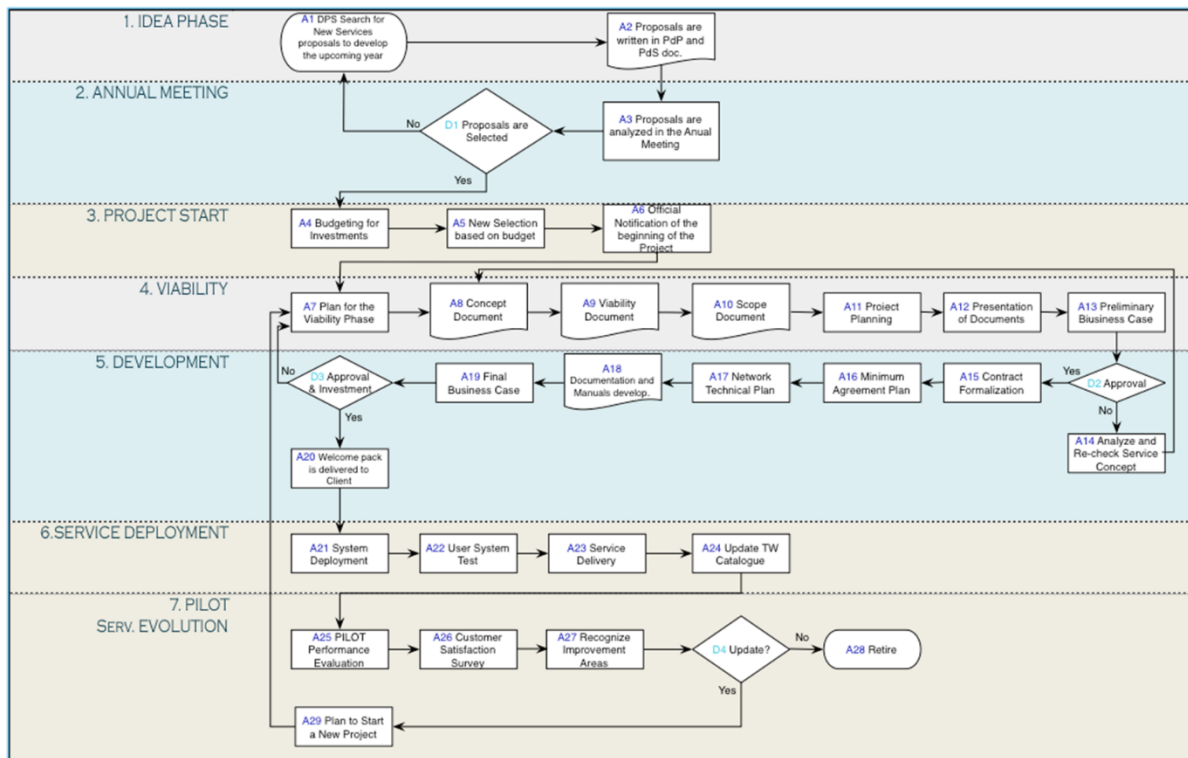
2.1. DMAIC – Definition Phase

This phase is characterized for discovering the lifecycle process in TW through the collection of data and information so as to understand and analyze the process of developing new services. The idea generation process for the development of new telecommunications services at the company begins at an annual meeting where new services to develop are proposed and selected. These services are referred as “Standard Services” because they are available to all customers from the moment of launch through the Service Portfolio.

Their development is described in three stages in the company: 1. The Annual Development Plan, followed by 2. The Service Development Process, and finally 3. The Monitoring Process (Company documents). So as to outline the problem and better analyse the situation, a flowchart in the form of current (“As-Is”) process maps is drawn, where activities, decisions and flows are defined (Figure 1).

The idea behind drawing the current flow of activities is to analyze and further uncover complexities in the process (Pyzdek and Keller, 2009).

Figure 1. “As-Is” Process Map for DEFINE phase (own development).



2.2. DMAIC – Measurement Phase

At this stage, where the process has already been defined, some indicators will be established in order to accurately find those drivers which can increase customer satisfaction and minimize service gaps.

CTQ is a concept, commonly used in improvement projects, which serves to describe the different output characteristics of a certain process. CTQ factors are identified through stakeholders and market analysis in this research study, focusing on the VOC and taking real customer needs into account (Reidenbach et al, 2002). A CTQ Tree is the selected tool for translating the customer's broad needs into more measurable requirements, using a three-level process (Figure 2). Initially, the focus is to identify actual needs and to consequently assign a quality driver with a measurable performance value (Basu, 2011).

Figure 2. CTQ Tree Diagram (own development based on Reidenbach et al, 2002).



Level 1 – Critical Needs or significant gaps are reported between the service developed and customer's expectations when developing new services. The need is to adapt internal processes, so they are oriented to increase customer satisfaction, which is achieved by understanding customer's purchasing criteria of wholesale services.

Level 2 - Quality Drivers correspond to the criteria used to measure the quality in NSD process which must satisfy a specific need identified in Level 1. From a customer's point of view, quality drivers are the factors that drive the purchasing decision (Reidenbach et al, 2002). Several ways are used in Six Sigma projects for collecting the Voice of the customer (VOC). In this study it is collected through market research and usage of customer surveys. This research study used as a reference a wholesale customer survey made by OVUM, which is an industry analyst focused on qualitative and quantitative research concentrated in the telecommunications industry. The outcome of the survey, combined with the company's internal information and requests for services (RFI), yielded a list of 13 criteria that are basic for the selection of a supplier of corporate services through the eyes of the end user and how this affects buyer's purchasing decision. The survey requested wholesale customers to rate two sets of data:

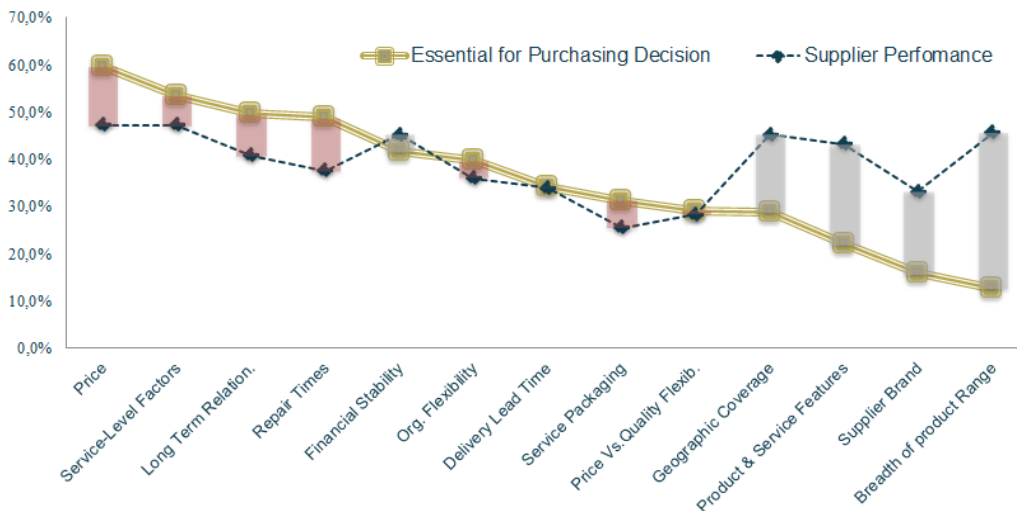
- Importance of the criteria when selecting a Wholesale Supplier. The scale used was: Essential for Purchasing, Important, Nice to Have, Not Important and unnecessary
- Performance of Wholesale Suppliers of the industry (as TW) rated by the customers. The scale used was: Excellent, Good, Adequate, Poor and Inadequate.

To appropriately prioritize the 13 criteria applied to NSD in TW, an analysis has been made based on the collected data using the Weighted Point Plan Method, assigning weights to the positive factors in order to select the most important critical factors for corporate users allocating:

- 70% to "Essential" or "Excellent to have"
- 25% to "Good" or "Important" and
- 5% to "Nice to Have" or "Adequate".

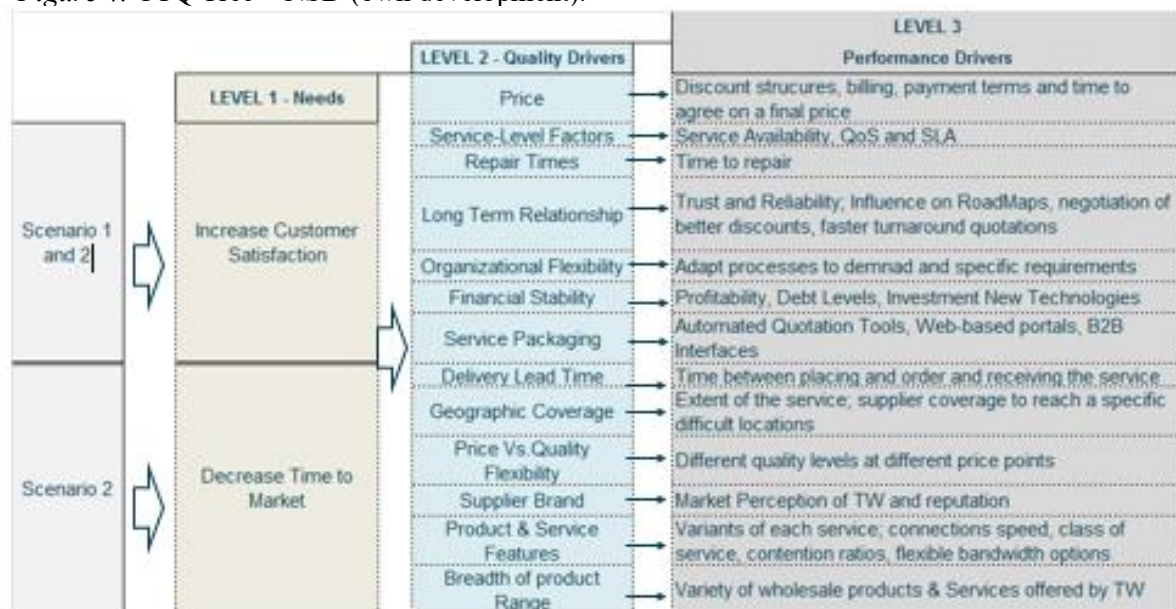
The effect of weighting the criteria allowed comparing the gap between the purchasing criteria of corporate users and the actual performance of supplier of services highlighting the disparity between both measures for the same criteria. The research identified several gaps and the biggest one was found in “Price” (Figure 3).

Figure 3. Purchasing Criteria vs. Supplier Performance (own development).



Level 3 – Performance Measures - The above Quality Tree reflects level of needs and the quality drivers to satisfy the selected needs according to each driver’s structure and characteristics within TW (Figure 4). These criteria reflect the VOC and the importance of certain factors when purchasing new services, but not all these factors can be impacted from the NSD lifecycle. For this reason, each driver is analyzed according to the impact they have in the NSD process in the company.

Figure 4. CTQ Tree – NSD (own development).

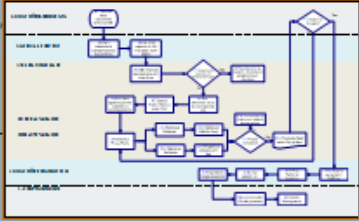


2.3. DMAIC – Analysis Phase

The purpose of the ANALISIS phase is to link value of each CTQ driver with the NSD activities described in the “As-Is” process maps to find which activities of the NSD can be targeted for improvement, and thus satisfy the needs.

Using the Value-process linkage method proposed by Reidenbach and Goeke (2006b) a CTQ Process Matrix, a simplified Quality Function Deployment (QFD) matrix, is build. in order to measure the relationship of each NSD activity, horizontally, with the 13 drivers, vertically. The scoring scale is with the following spheres of control: 9 for High Impact, 6 for Moderate Impact, 3 for Influence and 0 for no impact or control (Figure 5). Besides, each driver has an importance weight in the table representing the importance for purchasing wholesale Services. For instance, the criterion “Price” has an importance rate for the customer of 59,7%.

Figure 5. CTQ Process Matrix: Framework (own development).

CTQ PROCESS MATRIX		Driver 1	Driver 2	Driver...	Driver 13	IMPACT by ACTIVITY										
PHASES	INPUTS	WEIGHT OF THE DRIVERS BASED ON CUSTOMER IMPORTANCE				TOTAL KPOVs										
	Activity 1	●	○	●	●											
		●	○	●	●											
		●	○	●	●											
		●	○	●	●											
		●	○	●	●											
		●	○	●	●											
		● 52.69%	○ 59.62%	● 66.54%												
		<table border="1"> <thead> <tr> <th colspan="2">IMPACT</th> </tr> </thead> <tbody> <tr> <td>● 9</td> <td>High Impact</td> </tr> <tr> <td>○ 6</td> <td>Moderate Impact</td> </tr> <tr> <td>● 3</td> <td>Might Influence</td> </tr> <tr> <td>○ 0</td> <td>No Impact/Control</td> </tr> </tbody> </table>				IMPACT		● 9	High Impact	○ 6	Moderate Impact	● 3	Might Influence	○ 0	No Impact/Control	
IMPACT																
● 9	High Impact															
○ 6	Moderate Impact															
● 3	Might Influence															
○ 0	No Impact/Control															
						Red= High Impact Yellow= Medium Impact Green= Low Impact										

Once the performance assessment was made by the team, the author weighted the values assigned for each activity, and translated it into an Importance rate scale (70% for the most important, 25% medium importance, 5% low importance and 0% no importance) as shown in Figure 6.

The result of the CTQ Matrix (Figure 6), is used pinpoint two main findings, the first one based on the process activities (KPOV) targets improvement areas in current processes directly related to customer satisfaction and the second one, centered in the 13 drivers impact (KPIV), specifies a ranking of the most critical drivers currently present along the NSD lifecycle of the company.

Although it is worthy knowing the impact of variables in the process, a clearer image is provided in Figure 7, where discrepancies between customer desires (brown line) and TW variables related performance (light blue line) are palpable. Additionally, to these comparison, it is included the performance of suppliers in the industry (dark blue dotted line), rated by their own customers through Ovum’s surveys. Red error bars represent the gap between wholesale customer desires versus customer requirements.

2.4. DMAIC – Improvement Phase

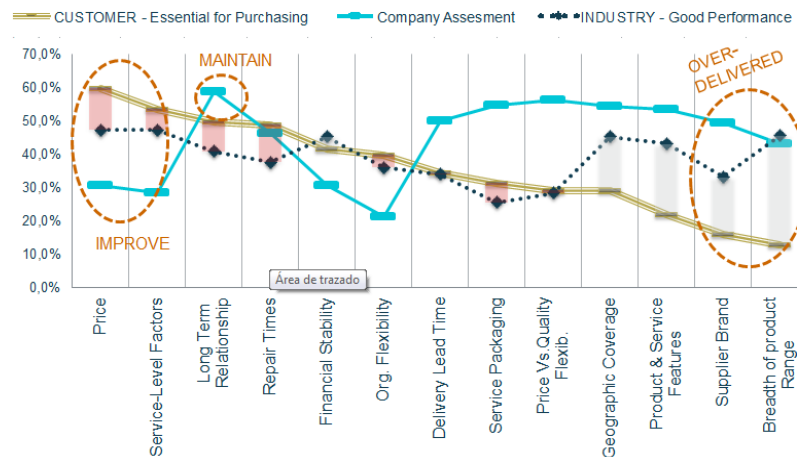
The IMPROVE phase seeks to identify the greatest opportunities for improvements based on the previously identified activities (Figure 7) through an Opportunities chart (Fry and Bott, 2004) by summarizing CTQ activities, along with a description of the affected drivers, and finally a proposal for mitigating the encountered situation.

The proposals and initiatives were classified according to the implementation period in short and long term, and covered improvements proposals for processes such as KPIs in order to track performance, Tools as improvements in the current surveys, and People, to build and improve relations with employees and internal and external customers.

Figure 6. CTQ Matrix (own development).

CTQ PROCESS MATRIX		VOC Essential for Purchasing Decision													IMPACT by ACTIVITY
		Price	Service-Level Factors	Long Term Relationship	Repair Times	Financial Stability	Org. Flexibility	Delivery Lead Time	Service Packaging	Price Vs Quality Flexib.	Geographic Coverage	Product & Service Features	Supplier Brand	Breadth of product Range	
PHASES	Process Scenario 1- INPUT	0,597	0,535	0,496	0,488	0,415	0,397	0,342	0,312	0,290	0,288	0,219	0,158	0,127	TOTAL KPOV
IDEA GENERATION	A1 DPS Search for New Services proposals to develop the upcoming year	3	0	9	0	9	3	0	9	9	6	9	9	9	19,11
Proposals Selection	A3 Proposals are analyzed in the Anual Meeting	6	0	9	0	9	0	0	9	3	3	9	9	9	17,11
PROJECT START- Financial Review	A5 New Selection based on budget	9	3	9	0	9	0	0	0	3	6	3	6	9	16,77
VIABILITY	A8 Concept Document Development	9	6	9	9	3	6	9	9	9	9	9	9	9	36,48
	A9 Viability Document Development	9	6	9	9	3	6	9	9	9	9	9	9	9	36,48
	A10 Scope Document Development	6	6	9	9	3	6	9	9	9	9	9	9	9	34,69
	A11 Proiect Planning	0	0	9	9	3	6	9	9	9	9	9	6	9	27,43
	A13 Preliminary Buisness Case	3	0	9	9	9	0	9	0	0	9	6	9	9	32,17
DEVELOPMENT	A14 Analyze an Re-check Service Concept	9	9	6	6	3	3	0	0	3	3	0	0	0	19,72
	A15 Contract Formalization	9	9	6	9	6	6	9	9	9	9	9	9	3	41,30
	A16 Minimum Agreement Plan	6	6	9	9	6	6	6	6	9	6	6	6	3	35,44
	A17 Network Technical Plan	0	0	9	9	6	6	6	9	9	9	9	9	9	32,34
	A18 Documentation and Manuals development	9	9	9	9	0	3	9	6	9	9	6	9	3	29,08
	A19 Final Business Case	9	9	9	9	9	0	0	0	0	9	9	3	3	36,44
	A20 Welcome pack is delivered to Client	3	3	9	9	6	3	9	9	9	9	9	9	6	35,19
SERVICE DEPLOYMENT	A21 System Deployment (internal)	0	0	6	6	6	6	9	9	9	6	9	6	6	26,52
	A22 User System Test	0	0	6	6	3	6	9	9	9	9	9	3	6	23,27
	A23 Service Delivery	0	9	6	6	3	6	9	9	9	9	9	9	0	28,27
	A24 TW Catalogue Update	0	6	6	6	3	6	6	9	9	9	9	9	9	26,78
Pilot, MONITORING & Service Evolution	A25 PILOT Performance Evaluation (user)	3	6	9	9	6	9	9	9	9	9	9	9	6	39,18
	A26 Customer Satisfaction Survey	3	9	9	9	6	9	9	9	9	9	3	9	9	39,85
	A27 Recognize Improvement Areas	3	9	9	9	6	9	9	9	9	9	9	0	9	39,74
	A28 Retire Service	9	6	9	0	9	0	9	9	9	3	3	9	3	24,84
	A29 Plan to evolve service & features	9	3	9	0	9	3	9	9	9	9	9	6	9	27,75
Impact by Driver	Total KPIV	30,63%	28,33%	58,75%	46,04%	30,42%	21,25%	49,79%	54,58%	56,04%	54,38%	53,33%	49,38%	43,13%	
70%	Qty 9 - High Impact	9	7	18	14	7	3	16	18	19	17	17	15	13	
25%	Qty 6 - Moderate Impact	3	7	6	5	8	11	3	2	0	4	3	5	4	LOW IMPACT
5%	Qty 3 - Minimal Impact	6	3	0	0	8	5	0	0	3	3	3	2	5	Med IMPACT
0	Qty 0 - No Impact	6	7	0	5	1	5	5	4	2	0	1	2	2	HIGH IMPACT
	TOTAL ACTIVITIES	24	24	24	24	24	24	24	24	24	24	24	24	24	

Figure 7. Performance vs. Customer Requirements (own development).



2.5. DMAIC – Control Phase

The Control phase aims to validate the CTQ framework. A standard service of the company is chosen. It has been on the market for approximately two years with low performance, and the methodology for validating the results is the same used to evaluate company performance in previous phases.

Once the analysis was performed through DMAIC, it was noted that several criteria considered “priority” for the customer, were not the central priority for the company when they designed the service and the results obtained through the CTQ matrix, demonstrates lack of customer-oriented processes for this specific service, highlighting the most CTQ to increase service sales.

3. Conclusions

Attracting and building robust relationships with customers demands a new way of thinking about markets, customers and industries as the research shows. Thirteen Quality Drivers essential for purchasing decision from customer’s point of view were identified. It showed the challenges that service providers face in remaining competitive by improving service quality and attracting new customers in today’s technology-based business environment, (Psychogios et al, 2012). The research concludes that more value will be obtained if the assessment is conducted at the initial stages of the development to position the services within customer priorities.

The main results of this study are originated from the “As-Is” process maps, which provided an integrative construction of customer value, not only because process flows were drawn from the end user service’s request, but also because drawing the layout and combining it with CTQ matrix allowed stressing the most critical-to-quality activities within the service cycle. Now the company has a visual management system to communicate how they contribute to delivering value to the customer.

Finally, other contribution of this research is the application of DMAIC approach, providing a methodical and systematic framework that can be used within a business context to ensure that the service improvement activities are customer-focused (Martínez-Martínez et al, 2018; Trehan et al, 2019). The DMAIC-Six Sigma approach showed a wider application and how firms can achieve competitive advantages, efficient decision-making and problem-solving capabilities within a business context.

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