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QFD-ANALYSIS AS A PROMISING TOOL FOR ASSESSING THE WORK QUALITY OF OUTSOURCER

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Abstract

The article covers the issues of using the QFD analysis to assess the impact of the quality of an outsourcer's work on a producer's creation of added value for a consumer and determining the degree of dependence of the manufacturer on the outsourcer. Often, customer requirements are known only to the manufacturer and are not clear to the outsourcer. The QFD-analysis allows forming a package of requirements on the part of the consumer for all participants in the production process of value. We will as well cover the issues of establishing the requirements for technological processes and equipment that will allow choosing a competitive outsourcer. This is all the more appropriate in the context of creating new, more competitive business models, for example, using freelancers. The use of such schemes is always associated with the risk of loss in the quality of work. These questions also can be resolved with the help of the QFD analysis. The task of finding a tool that will streamline the interaction between the consumer, the manufacturer and the outsourcer, will ensure product quality management without losing it through the fault of the outsourcer solved using the QFD analysis method. Based on the theoretical search and generalisation of points of view on the problem under study, using the empirical data of a particular enterprise, the authors concluded that it is advisable to use the QFD analysis to manage the quality of work of all subjects of interaction in the process of creating consumer value.

1. Introduction

In modern conditions of globalisation, many managers are aware of the need for the division of labor as the most profitable basis for doing business. However, the understanding of the feasibility of specialization at the micro level as the removal from the structure of a company of a part of non-core, auxiliary, or too expensive activities has come relatively recently. To provide the necessary competitive advantages, many companies are shown to specialize in the area that can be defined as the key. However, ignoring minor and related activities can lead to a significant reduction in the overall quality level of the final product. In this regard, it is advisable to analyze the contribution of the outsourcer to the growth or decline in the quality of work performed by the company, as well as the risks from outsourcing the work. The QFD analysis toolkit traditionally used to convert customer requirements into the technical characteristics of the products produced can be used not only to control the quality of the manufacturer's processes, but also to control the processes transferred to the outsourcer (Rudenko & Hochradel, 2017).

For example, the House of Quality (QFD) provides an opportunity to formulate production conditions for an outsourcer (requirements for the quality of the work they provide), determine their impact on the achievement of consumer preferences, and assess the risk of reduced product quality due to the outsourcer (Lyapina, Stroeva, Vlasova, Konnobeeva, & Konnobeeva, 2017).

2. Problem Statement

In the process of outsourcing works arises the problem of formulating technical requirements for an outsourcer product, which is caused by the lack of direct contact with the consumer. This task is related to the problem of analysis, evaluation, as well as ensuring the quality of the outsourced service and at the same time with the problem of identifying risks in the transfer of work for outsourcing. QFD analysis allows solving the abovementioned problems.

3. Research Questions

3.1. How to use the QFD analysis to select an outsourcer?

3.2. How to use the QFD analysis to convey the requirements of the consumer and manufacturer of the product to the outsourcer?

3.3. How to determine the magnitude of the risk of quality loss when outsourcing part of the functions?

3.4. Is it possible to assess the degree of manufacturer dependence on the outsourcer using the QFD analysis?

4. Purpose of the Study

To acquire and retain a competitive advantage by the manufacturer due to the deepening specialization of labor and the rational use of the resource component, it is advisable to transfer part of the non-core and / or costly functions to outsourcing with subsequent quality control of their implementation.

This leads to the need to find a tool to streamline the interaction between the consumer, the manufacturer and the outsourcer and at the same time ensure product quality management (Maritan, 2015).

The goal of our research is to consider the possibility of using QFD analysis as a tool for studying and evaluating the quality of an outsourcer's work, which allows making comprehensive conclusions about the possibility of transferring some functions to outsourcing without losing their quality characteristics established by the requirements of the consumer of products.

5. Research Methods

5.1. System approach allowed to study the problem in connection with all of its components: the consumer, the manufacturer and the outsourcer. As well as determining the impact of each of them on ensuring the final quality of the work of the company and its competitiveness.

5.2. An integrated approach allowed us to get an integrated view of the role of the outsourcer in ensuring the quality of the work by the producer and the level of risk of loss of quality and, accordingly, the weight of the manufacturer's competitive advantage.

5.3. QFD analysis allowed transforming consumer requirements into product specifications, evaluating the outsourcer's contribution and streamlining the functions assigned to it, determining the degree of risk of quality loss when outsourcing the work.

6. Findings

According to the academic community, outsourcing is an organizational and economic decision which allocates non-core business functions or parts of an organization's business process for servicing by an outside organization, while ensuring transparency of business processes, growth of investment attractiveness and, as a result, increasing the competitiveness of the business as a whole.

Currently, the trend of using outsourcing services is gaining momentum. There is even an established list of services which in world practice it is advisable to outsource.

The transfer to the outsourcing of a certain range of business processes implies the fact that the outsourcer will perform the operations professionally, efficiently, on time and at reasonable prices. The outsourcing company must be competitive in comparison with other similar firms. This is an important aspect of its activities, as it takes part in the creation of a higher consumer value by the manufacturer. The basis is the outsourcer's superiority in quality, level of production costs and management methods used, including those related to building relationships and the use of innovations (Vasiliev, Odinokov, Borisova, & Letuchev, 2016). The competitive advantage of the outsourcing service is formed as a result of the ratio of perception and customer expectations. At the same time, the technical quality of the outsourcing service is based on the existing competencies and technologies. And functional quality presupposes the effectiveness of managing connections and interactions with both the producer of the product and its consumer (Kobyak, 2011). This is made possible by applying the QFD analysis (Quality Function Deployment), as a sequence of procedures that make it possible to formulate requirements, including the outsourcer's products. We are talking about the methodology of systematic and structured transformation of the desires of the consumer in the requirements for the quality of products, services and

/ or process, which allows taking into account the requirements for the quality of outsourcing work in the model being created.

To convey to the outsourcer the wishes of the consumer, which he must provide in whole or in part, possibly by creating house of quality of the outsourced service. Part of the characteristics will be dictated by the product's house of quality, created on the basis of the wishes of the consumer, the rest will be formulated by the outsourcer based on an assessment of their capabilities and the mutual influence of the requirements for the product. This tool allows to decompose the requirements for an outsourcing service into constituent characteristics that ensure customer satisfaction and product manufacturer using outsourcing (Kleiner, 2017).

Thus, when assessing the quality of an outsourcing service, it is necessary to take into account three levels of assessment: consumer, producer and outsourcer, that is, the composition of quality assessment indicators and their weighting factors are created on the basis of consumer quality indicators and producer quality indicators.

Let us consider an example of using the QFD analysis in order to assess the level of quality of an outsourcing service. The company "ALPHA" is engaged in corporate supplies of equipment and software, integration of information systems into the customer's infrastructure, as well as complex projects using of solutions in the field of information and physical security, networking and telecommunications, web development. The organization is quite young and is on the market for 5 years. In connection with the expansion and growth of the company, it became necessary to attract an additional personnel unit of IT engineer (Lewis, Welsh, & Dehler, 2002). Since keeping a private IT engineer in-house is quite expensive, the optimal solution in this case is the outsourcing of this function. Engineers who are outsourced are usually cheaper for a company than full-time units, so there is a possibility of reducing the cost of design work. It is advisable to note that in this case the firm receives not only the work or function performed, but also the accumulated experience and knowledge of an outside participant, which do not need to be maintained and updated, but which can be successfully used in the future.

Using the QFD analysis we will build the House of Quality model in order to determine the efficiency of transferring the functions of an IT engineer to outsourcing.

The weight of the company's characteristics with respect to customer requirements (absolute value) will be calculated as the sum of the products of the weight of the relationship between indicators and the absolute weight of each characteristic established by an expert:

$$B_{x1} = \sum_{j=1}^{n} Bxi(xj) \qquad (1)$$

It is important to take into account the weight of links, which have the following values:

- «9», - «3»,   - «1».

Given these requirements, we calculate the absolute value using the example of the first technical characteristics of the service manufacturer.

$$B1 = 6.0 * 3 + 6.0 * 1 + 9.0 * 9 = 105.$$

The House of Quality is presented in Figure 1.

The next step is the determination of the direct and indirect influence of characteristics on each other. This effect can have both a positive (direct relationship between the values of the characteristics) and a negative (feedback between the values of the characteristics) sign. In order to establish the vector of influence in the quality of the house included a matrix of the type "roof". In the matrix, the influence vector is reflected in the form of the corresponding arithmetic signs (Semenov, Mikhailov, & Menshakova, 2016).
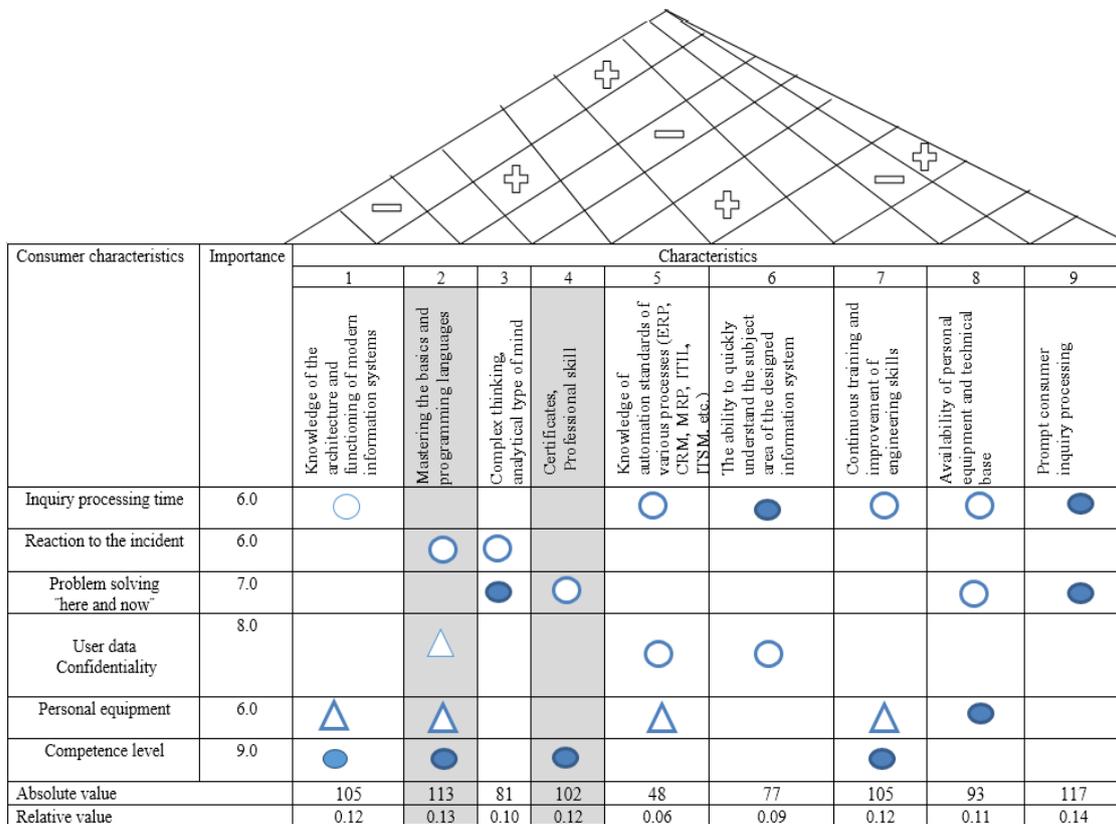

Consumer characteristics	Importance	1	2	3	4	5	6	7	8	9
		Knowledge of the architecture and functioning of modern information systems	Mastering the basics and programming languages	Complex thinking, analytical type of mind	Certificates, Professional skill	Knowledge of automation standards of various processes (ERP, CRM, MRP, ITIL, ITSM, etc.)	The ability to quickly understand the subject area of the designed information system	Continuous training and improvement of engineering skills	Availability of personal equipment and technical base	Prompt consumer inquiry processing
Inquiry processing time	6.0	○				○	●	○	○	●
Reaction to the incident	6.0		○	○						
Problem solving "here and now"	7.0			●	○				○	●
User data Confidentiality	8.0		△			○	○			
Personal equipment	6.0	△	△			△		△	●	
Competence level	9.0	●	●		●			●		
Absolute value		105	113	81	102	48	77	105	93	117
Relative value		0.12	0.13	0.10	0.12	0.06	0.09	0.12	0.11	0.14

Figure 01. House of quality of an IT-engineer

Having determined the vector of the influence of characteristics on each other, we will bring them into the "roof" of the house of quality.

The share of the direct impact of the quality characteristics provided by the outsourcer on customer satisfaction can be calculated as the ratio of the sum of the weights of the characteristics provided by the outsourcer to the sum of the weights of the characteristics formed when studying consumer needs. Since a direct influence is more significant from the point of view of its influence than an indirect one, we will calculate its value. When transferring the functions of an IT engineer to outsourcing, characteristics 2 and 4 will be provided by the outsourcer enterprise. Therefore, the direct impact will be equal to:

Direct effect = 215/841 = 0.26 or 26%.

So, the obtained coefficient indicates the acceptable risk level of the negative influence of the outsourcer on the end user. However, in this case, first of all, it is important to conduct a thorough analysis of these risks (Anfinogentova, Dudin, Lyasnikov, & Protsenko, 2017).

For the company, such experience is acceptable and in case of a positive decision regarding the transfer of IT engineer functions to outsourcing, the company only needs to monitor activities and take timely measures in case of failures.

7. Conclusion

Thus, QFD analysis (the method of structuring the quality function or the method of "house of quality") has found distribution as a universal tool for creating a product that guarantees the interconnection of elements of the production system and their exact correspondence to consumer preferences. This versatile tool allows manufacturers to transform consumer expectations into product specifications and requirements for production processes and equipment as a result of sequential actions (Hoffmann, 1997). This is an expert method that uses a specific tabular way of presenting information, consisting in the sequential construction of "quality houses", within which the actual indicators of product quality or consumer characteristics (rows) and ensuring their technical requirements for products, processes and equipment (columns) are interrelated. Some of these requirements can be provided by an outsourcer.

Auxiliary quality indicators provided by an outsourcer are important for the manufacturer, but not always significant for the consumer. Therefore, the refinement of the QFD analysis procedure in terms of introducing an additional level - the house of quality of the outsourcer will allow the manufacturer to control the quality level of the functions transferred to the outsourcing. And the outsourcer will give the opportunity to take into account the expectations of consumers.

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