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THE ANALYZATION OF THE CONCEPT OF QUALITY EXAMINED THROUGH A MODEL UNDER THE APPROACH TO VALUE ENGINEERING WHICH IS DEFINED AS A CONTEMPORARY MANAGEMENT TECHNIQUE

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ABSTRACT

Value engineering can be expressed as a contemporary management technique which has an expanding area of usage as time goes by and therefore its importance is understood better as the days go by. We tried to explain the role of quality within the scope of value engineering that is performed in this study. Firstly, the history of value engineering and its basic framework is examined, and second, the concept of quality and all aspects of the total quality management are explained. In the model section which is the third part, the concept of quality within the scope of value engineering, the relationship between value and quality, and the examination of the model which is included in the basic elements of value engineering, are considered one by one. Review for the concept of quality within the scope of value engineering is carried out by means of a model which is created by taking into consideration the basic elements of the value methodology.

Keywords: *Value, Value Engineering, Quality, Quality Management, Value Methodology*

ÇAĞDAŞ YÖNETİM TEKNİĞİ OLAN DEĞER MÜHENDİSLİĞİ YAKLAŞIMI KAPSAMINDA KALİTE KAVRAMININ İNCELENEREK BİR MODEL ARACILIĞI İLE ANALİZ EDİLMESİ

ÖZET

Değer mühendisliği gün geçtikçe önemi daha iyi anlaşılan ve kullanım alanı genişleyen bir çağdaş yönetim tekniği olarak ifade edilebilir. Gerçekleştirilen bu çalışmada, değer mühendisliği kapsamında kalitenin rolü ifade edilmeye çalışılmaktadır. Çalışmada ilk olarak, değer mühendisliği tarihi ve temel çerçevesi incelenmiş, ikinci olarak ise kalite kavramı ve toplam kalite yönetimi konuları ifade edilmeye çalışılmıştır. Üçüncü kısım olan model bölümünde, değer mühendisliği kapsamında kalite kavramının nasıl bir konum aldığı değer ve kalite ilişkisine ilişkin bir model aracılığı ile ele alınmış ve değer mühendisliğinin temel unsurları kapsamındaki bu modelin ne ifade ettiği belirtilmiştir. Değer mühendisliği kapsamında kalite kavramının incelenmesi, değer metodolojisinin temel unsurları dikkate alınarak oluşturulan bir model aracılığı ile gerçekleştirilmiştir.

Anahtar Kelimeler: *Değer, Değer Mühendisliği, Kalite, Kalite Yönetimi, Değer Metodolojisi*

1. INTRODUCTION

In today's world, one of the most important concepts for business enterprise is the competition. Business enterprises implement different management techniques to survive in the increasing competitive environment. One of the issues is value engineering so-called the contemporary management technique. Value engineering is based on the product's functions – in other words, function is the basis for value engineering.

In the general consideration of value engineering; function, performance, and the creation of a balance between quality and cost is very important. From this perspective, the concept of quality can be seen as an important influence within the scope of value engineering.

Quality is the one that taken into consideration as a very popular topic nowadays and put into effect, and therefore total quality management is also used to gain competitive advantage for business enterprises. In the study, the examined quality within the scope of value engineering, and the relationship between value and quality by means of a model is available.

Studying has considerable importance in terms of widely recognition and application for the concept of value engineering as a contemporary management technique via business enterprises. Moreover, in the future, a fresh idea might occur for the new studies by means of the concept of examined quality within the scope of value engineering, and the model establishment as well.

2. VALUE ENGINEERING

2.1. Historical Development of Value Engineering

Value engineering has been brought up by Lawrence Miles for the first time during the Second World War. Miles, formed various teams in order to find solutions to the problems encountered in General Electric, and thus value engineering began to develop. The goal here is, scarce resources are more valuable and these resources should be made best use of and alternatives should be tried to create to fill in for the location of these resources. According to him, the function of a product, that is, analysis of fulfilling its functions, leads to the development of different material and production methods. Assessment of this function is called "value analysis" and it shows the basic points of value engineering. Contrary to the other cost-reduction techniques used in business enterprising, value analysis has the possibility for the implementation of all business units such as value engineering planning, design, R&D, purchasing, and quality (Urhan, 2004: 53-54).

2.2. Basic Framework of Value Engineering

The value methodology is applied as a systematic and structured approach to projects, products and processes. The value methodology is used in the manufacturing of products and processes, design and construction of projects, operation and management of processes. The value methodology helps the realization of a successful balance among necessary resources, necessary functions of performance, quality, cost coverage and other. Ensuring an appropriate balance provides maximum value in

projects. Value is the reliability of functions' performances that meet customers' needs at the lowest cost. Function is the performance of natural or characteristic effect of the product or of service. Cost is the necessary expenditure on a project, service, process or production of structure. The value equation is as follows - Value = Function / Cost (SAVE, 2011: 1).

Value's alternative definitions for different people are in the following (Park, 1999: 95):

According to Bryant:
Value = (Wants + needs) / Resources

According to Harris:
Value = Worth / Effort

According to Kaufman:
Value = Function / Cost

According to Wasserman:
Value = Function / Cost = Utility / Cost = Performance / Cost

According to Fallon:
Value = Objectives / Cost

The value equations are also expressed by Park as in the following way (Park, 1999: 120-121):

Value = Function / Cost or Value = Function / Price

Value = Function / Price = [(Performance + Quality) + Availability] / Price

Value is defined as the lowest cost provided by a function (Park, 1999: 97). Value is expressed as the lowest cost ensuring any type of quality given at any time at any location for the necessary function and the services. On the other hand, function can be defined as a factor which allows the product to fulfill its natural purpose or a factor providing the service. Value engineering can be expressed as the process of designing, manufacturing and marketing at less cost for provided functions that meet the customers' expectations for a product or service. Value engineering is defined as a systematic approach to the specific techniques to provide function reliability at the lowest possible cost that determines the function of a product or service by establishing a monetary value to the pertained function (Urhan, 2004: 53-55).

The concept of value is based on needs and expectations to ensure satisfaction and in order to achieve satisfaction, the necessary resources are available (IVM, 2011: 1). Value can be expressed as an abstract measure that determines the importance of something, something in response to have a value of (Saruhan and Yıldız, 2009: 58).

Value engineering can be defined as a product design activity revising the functions which are needed by customers. Value engineering revises these functions from different perspectives in order to achieve a lower cost (Altınbay, 2006: 147).

In general, value engineering, can be described as a method of all efforts which is being directed to maximize the created value. The main idea of this method can be expressed as combining the logical operations with human factor (Beşorak, 2005: 354).

Value engineering can be defined as a process which is related to the project to determine the most appropriate solution to the cost of the project, quality, and functions (Omigbodun, 2001: 41).

Cost element gained gradually more importance in today's world, and when compared with other cost reduction techniques, value engineering doesn't nourish only the cost reduction aim. The main purpose of value engineering is, to find the answer to the question – "How else do I get this function?" (Dönmezer, 2003: 35).

Value engineering is not seen as an alternative method to traditional cost calculating methods. In this method, the purpose is, to keep the costs on the calculated level rather than calculating the cost (Acar and Alkan, 2003: 63).

3. QUALITY MANAGEMENT

The word "quality" which is frequently used in daily life, originally means "suitability for use" and in Latin, the root of the word "qualis" means "how it is formed" (Serinkan, 2008: 229).

Total quality management can be expressed as the concept of management that started in the 1980s and gained popularity in the 1990s. The issue "quality" has become one of the key issues in business administration. The first systematic studies related to quality management could be conveyed to the studies of W. A. Shewhart till the year 1932. However, this issue has not become a level of distinct management guiding all business activities until the 1980s. Up to these dates, the issue "quality" has been developed as a business, more in production, as a form of statistical quality control applications in the responsibility of specific people or departments. Various researchers, in particular Philip Crosby, Edward Demings, Armond Feigenbaum, Joseph Duran and Kaon Ishikawa have put forward some ideas in the years between 1950 and 1960. And with the emergence of globalization, the concept of quality became a basic subject which gives direction to all business activities (Koçel, 2010: 373-374).

Quality is just one of several factors as the detection of the high-quality or good-quality product in markets. Quality is an important phenomenon and it makes the product to be wanted by its consumers (Park, 1999: 119). In general, quality is defined as level of fitness to aim (Kobu, 2008: 515). The concept of quality can be expressed as consumer satisfaction (Anderson, Öneş, Kepir Sinangil and Viswesvaran, 2009: 427).

When we say a product's quality, then some issues come to mind such as suitability for use, performance, security and reliability. For quality, compliance with certain specifications has lost its validity in today's world, and good and service's suitability for use or the principle - fulfilling customer requests, really stands out. The quality of a product consists of product's importance; quality of design, quality of suitability and the quality of after-sales which may change depending on the customer's level of consciousness. Total quality management can be expressed as an approach which aims at each and every three of the qualities (Güney, 2007: 569). Total quality management can be expressed as management idea which struggles for continual

development all functions of the organization (Kaynak, 2003: 406). Total quality management is an approach based on continuous improvement and customer satisfaction (Çetin, 2001: 3).

The concept of total quality management means that organization's culture is defined by and supports invariable accomplishment of customer satisfaction through an completed system of tools, techniques and training. This implies the continual improvement of organizational processes, concluding high-quality products and services. Total quality management is necessarily employee guided because product or service quality cannot be continuously developed without the effective learning and participation of every employee. In this way, in successful quality improvement programs, total quality management principles are settled in the organization's culture (Kinicki and Kreitner, 2005: 11-12).

Total quality management is popular approach which based on a decentralized control philosophy. Total quality management, an organization-wide effort to infuse quality into every action in a firm through continual improvement. Managing quality is a related for every organization. Total quality management philosophy focuses on teamwork, raising customer satisfaction and lowering costs. Organizational practice total quality management by encouraging managers and employees to collaborate across functions and departments, besides with customers and suppliers, to identify areas for improvement, no matter how small (Daft and Marcic, 2010: 333-334).

Total quality management is a popular topic all over the world, but particularly it's considered important in industrialized countries (Samson and Terziovski, 1999: 393). Quality is as significant in service industries as manufacturing firms, and quality should be expanded organizations from top to bottom (Bowman, 1994: 129). Total quality management is an approach that improves competitiveness, efficiency and flexibility for all organizations (Pheng and Teo, 2004: 8).

Total quality management can be expressed as a management technique which fulfills customer's expectations as well as provides cost advantage, along with a number of compliance standards (Saruhan and Öncer Özdemir, 2004: 86).

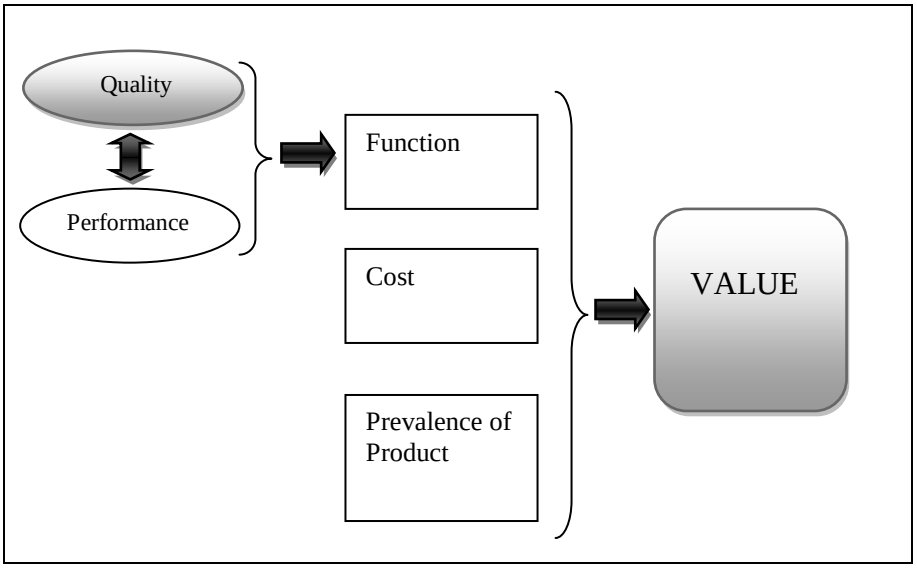
Total quality management is an integrated management philosophy emphasizing some practices such as continuous improvement, meeting customer needs, long-term thinking, and a teamwork strengthening employee relations, the processes of re-design, competitive benchmarking, team-based problem solving, constant measurement of results and closer relationships with suppliers (Powell, 1995: 16).

Total quality management practices have become prevalent hitherto between manufacturing companies as well as companies not making the production. Intense competition in markets, led manufacturing companies some researches by providing competitive advantage in manufacturing processes and operations. Total quality management practices in this context, create a synergistic effect on organizational performance. As shown in some studies, total quality management practices, reduce the changes in manufacturing processes, prevent layoffs and improve the quality of performance (Chong and Rundus, 2004: 155).

4. THE ANALYZATION OF THE CONCEPT OF QUALITY EXAMINED THROUGH A MODEL UNDER THE APPROACH TO VALUE ENGINEERING

Function can be expressed as a combination of the demanded quality and performance. On the other hand performance is, what the product can live up to all the consumer's expectations. The level of quality enhances the performance or can reduce it. The appropriate price should be the price that the consumer is willing to pay, or the fair price that the consumer agrees to pay (Park, 1999: 121).

Figure 1: A Model for the Relationship Between the Value and Quality Regarding Value Engineering



According to the model illustrated above, function consists of a combination of quality and performance. According to the value methodology, quality joining to performance integrates the function. Quality can be expressed as the factor that reduces or increases the performance.

Quality is seen as an element joined to performance. Poor quality reduces the performance, high-quality increases the performance, and in some cases regarding purchased products, circumstances initially unnoticed and providing unexpected satisfaction lead to performance increase. When high-quality is added to performance, then a higher value can be created for the consumer (Park, 1999: 121).

As it is known, value is the ratio of function to cost. Value at the same time defined as the ratio of function to price. From this perspective, cost and price are two important elements connected with each other.

Performance is what the product can live up to all the consumer's expectations. Quality is the one of several factors providing the product to be perceived as a good one. Quality is an important phenomenon and it makes the product to be wanted by its consumers (Park, 1999: 119-121).

The most important elements of value engineering are function, cost, quality and performance. And the connections of these elements have been revealed clearly in this model. The combination of quality and performance, namely the advancement of quality integrating performance is the function. Function is the component that can be seen and it can be expressed as the most important element of value engineering. Because the function takes over the place in the creation of value regarding value engineering.

Value engineering keeps the functions and quality while reducing the cost and aims to improve even further. The purpose of value engineering studies is not to minimize the costs but to reach a certain level of cost (Urhan, 2004: 56).

In order to create the value, functions should be given priority to. When the product or service is analyzed with the separation of its functions, every function should be examined in the best way. While every function's cost is being reduced, quality and performance should be improved. Value can be increased in this way and the continuity of the product can be provided. Generally, value is expressed as the balance between function and cost. According to the model given here, the components of value are made up of three factors - function, cost and prevalence of the product. In addition to function and cost in this model, integrity is provided by adding the prevalence of the product.

According to this model, if a product provides high quality and delivers maximum performance then a high value is set for the product. According to the model, function part which is the first part of the three factors that create value is well practiced in this case. In this process, when the functions of the product is well-organized, then the costs of each function is reviewed, and thus the cost is lowered depending on function. Thus, the second phase which forms the model is the cost factor and it is applied in a good way for the creation of value. According to the model, prevalence of the product has been added to these two factors - function and the cost as a new factor. The meaning of this factor is the presence of a high-value product that the consumer can buy. In other words, the consumer should not have any difficulties in access to this product. The moment that the product creates high value, it can be found at any location.

In the concept of quality within the scope of value engineering through the consideration of a model related to value and quality relationship, it is emerged that the quality is the sub-element of value. At the same time, according to this model, quality is an element of the function. The level of quality affects the performance and while high quality maximizes the performance, low-quality affects the performance in a negative way. Function is a combination of quality and performance. As mentioned before, when we say the performance of a product, then we mean the consumer's expectations for the purchased product. Function, cost and prevalence of the product is expressed as the three main factors that set the value in this model. Here, quality is described as an element of function. As stated, the term "quality" gives the product a type of focus to be perceived as a good one and therefore evokes more requests for the purchase of a product.

In the model, the attempt to express the main issue within the scope of cost is, to ensure the realization of each function as evaluating the functions of a product and increasing the level of its quality at a lower cost. Thus, quality will increase while the cost fall. Here, the cost can be seen as a very important factor in the fixing the price of the product. The prevalence of the product which is expressed as the third factor of value, can also be explained as ensuring the prevalence of product in the market while the product is in a position to provide value.

5. CONCLUSION

In this study, the concept of quality is discussed within the scope of value engineering. Function, performance, quality and cost balance are the basic framework for value engineering which is a contemporary management technique. However, the function is the basis for value engineering. In the study, within the scope of value engineering, a model has been obtained by taking into account the role of quality. This model is based on the relationship between value and quality within the scope of value engineering.

In the model, quality is seen as an element of function and therefore function is the basis for value engineering. According to this model, in order to obtain the value, the appropriate combination of function, cost and prevalence of the product is required. At the same time, cost which is to be created for the product and level of quality are associated with function. The importance of the first functional factor emerges and it also comes to mind when value engineering is mentioned. Here, at the same time, product's level of quality will affect its performance and quality plus performance will give rise to function. So, as a conclusion, cost is emerged depending on function, and value is came into existence by adding the prevalence of the product to these two factors. Thus, it has emerged that both quality and performance affect the value as elements of function.

Upon this study carried out, the relationship between quality and the issue of value engineering will be better understood and furthermore, this study may provide ideas for researches which is thought to be done in this direction.

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