

Internal customer satisfaction improvement with QFD technique

Internal customer satisfaction improvement

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Abstract

Purpose – The purpose of this paper is to employ quality function deployment (QFD) method for translating internal customer needs and expectations into appropriate service specifications to perform existing process assessments in relation to quality characteristics for increasing internal customer satisfaction.

Design/methodology/approach – The integration of SERVQUAL into QFD has been used to set the success factors to improve quality in the textile industry. One of the largest textile companies in Turkey provided the sample. A SERVQUAL-type of questionnaire was used and a total of 32,938 questionnaires were distributed both manually and online, 24,551 usable were received, comprising a response rate of 77.31 percent.

Findings – Findings of the QFD application suggest internal customer focus as having the highest weight score of almost 12 percent improvement. In addition, improvements in technical requirements of politeness and process communication have a 9 percent impact each on internal customer satisfaction criteria.

Research limitations/implications – QFD technique is able to provide companies with a better understanding of internal customer expectations and translate these into appropriate service specifications and perform existing process assessment.

Originality/value – This paper is a first attempt that applies this integrative approach to a different type of industry, thus offering practical and applied information for professionals engaged in academia and as practitioners.

Keywords SERVQUAL, Turkey, QFD, Internal customer, Quality

Paper type Research paper

1. Introduction

Globalization and increased competition have impacted continual improvement needs regarding quality throughout the world including in Turkey. Since the Turkish textile industry serves as a major exporter to the world, the importance of quality comes into play itself. Customer satisfaction is defined in both types of customers, internal and external. Tennant (2001) and Kendall (2007) describe external customers as the people that are not directly connected to the organization, and internal customers being the people directly connected to the organization, in other words, the employees.

Reeves and Bednar (1994), Kelemen (2003), and Stracke (2006) pointed that the term internal customer ought to receive broad acceptance in total quality management (TQM) literature. This definition adds another dimension to the classical definition of



customer, who buys goods or services. Berk and Berk (2000) also mention that external customers do not have to be outsiders since they can also be inside the firm dealing with the supply of the goods and services.

Quality function deployment (QFD) technique is able to provide companies with a better understanding of customers' expectations. In this paper, the technique is used to translate internal customers' needs and requirements/expectations into appropriate service specifications and perform existing process assessments in relation to quality characteristics. In addition, the factors affecting the satisfaction of the internal customer are examined in detail.

2. Literature survey

The most common use of the word "customer" is perhaps in the context of a typical retail transaction. A customer comes in, decides what he/she wants, pays the money and receives the goods or services (Wood, 1997). In other words, a customer can be defined as a person who purchases or uses the commodity (Abanoz, 2008).

The above definitions of customer usually bring the idea of end users of a commodity or a service into one's mind. Yet, commodities with a physical size in the first place, all commodities including services are composed of a long activity chain covering processes like production of those commodities, measurement of their qualities, their pricing and distribution. Each of the mentioned activities is executed by one or more customers and the output of each activity is used by another person in the chain. Consequently, customers could be explained as "the people both inside and outside the company who are purchasing the product of the process" and based on this definition, customers are analyzed in two groups (Tennant, 2001). Thus, in this study, employee will be referred to as "internal customer."

In the context of TQM, the main focus is on both types of customers. Satisfaction of the internal customers is important in terms of the motivation and the execution of healthy work processes. It is not possible for an organization to meet its customer demands without taking its internal customers' expectations into account (Jun and Cai, 2010).

Evidently, the internal customer satisfaction has received considerable scholarly attention. Many companies have started to invest substantial amounts of resources in programs to develop, monitor and increase internal customer satisfaction (Heskett *et al.*, 1997). It is assumed that internal customer satisfaction must lead to motivated and committed employees, more effective and efficient work, and in turn higher process and product quality (Eskildsen and Dahlgaard, 2000). This factor has been commonly studied as an outcome variable (e.g. Kirkman and Shapiro 2001; Ellickson 2002), but scholars have also investigated it as an antecedent of internal customer turnover intention and absenteeism (e.g. Farrell and Stamm 1988; Tett and Meyer 1993; Griffeth *et al.* 2000).

Among the many antecedents and consequences of internal customer satisfaction are the focus on how these are related with the organizational systems and dynamics. According to Marshall *et al.* (1998), internal customer service is a two-sided exchange process among people in various departments of a company in which the supplier has to respond to the requirements of internal customers in line with the TQM philosophy.

In order to figure out the factors affecting the motivation and satisfaction of internal customers, QFD is normally used. It is a technique for investigating the voice of customer (Jiao and Chen, 2006). It helps the firms in deciding the most important factors to be initially improved. Akao (1990) defines QFD as a method for defining design qualities, which aim to keep with customer expectations and then translate these customer

expectation/requirements into design targets and critical quality assurance points that can be used throughout the production/service development phase.

QFD was used by many researchers in various service areas. Benefits of QFD applications include better design and lesser service costs, fewer and earlier design changes, reduced product development time, fewer start-up problems, better company performance, improved service quality, and above all, increased customer satisfaction (Franceschini and Rossetto, 1995; Kim *et al.*, 1998).

The SERVQUAL approach is considered a departure from the traditional way of using perception-based measure for a customer satisfaction predictor. Instead of using perception, SERVQUAL suggests using expectation/perception (the service quality gap) as an enduring perception that can predict customer satisfaction with a service provider (Babakus and Mangold, 1992; Parasuraman *et al.*, 1991).

The relationship between service quality and customer satisfaction is somewhat reciprocal. Previous research on the relationship can be divided into two schools of thought: one argues a satisfied customer with good perceptions about service quality considering customer satisfaction as a service quality antecedent (Bolton and Drew, 1991); while the second suggests that service quality leads to customer satisfaction, considering service quality as a customer satisfaction antecedent (Antreas and Oopoulos, 2003; Cronin and Taylor, 1992; Spreng and Mackoy, 1996). Yet, both schools agree there is a strong correlation between customer satisfaction and service quality.

In the literature, many examples that combine SERVQUAL and QFD in different ways and in different industries can be found (Camgöz-Akdağ *et al.*, 2012, 2013). Franceschini and Terzago (1998) have determined the needs of all actors playing different roles in industrial training courses within the Kano model and converted these needs into design characteristics using QFD. Matzler and Hinterhuber (1998) followed a similar methodology for the ski industry. Tan and Pawitra (2001) proposed an integrated approach involving SERVQUAL and QFD for evaluating the image of Singapore from the Indonesian tourist's perspective. Lim *et al.* (1999) adopted SERVQUAL for performance measurement in Singapore and used the empirical findings as an input for QFD in the process of designing services based on customer expectations for hospitals.

The approach has helped organizations to evaluate internal customer satisfaction, guide improvement efforts in strengthening their weaker attributes and to expedite the development of innovative services through the identification of attractive attributes embedding these into future services. According to the literature, there are no limitations on specific industry or customer type where SERVQUAL and QFD are applied together. These two techniques can be applied for both internal and external customers no matter what the type of industry is. Since we are applying this technique to a textile company, we briefly introduce basic characteristics of the textile industry in Turkey to begin with.

3. Textile industry in Turkey

The history of textile production in Turkey goes back to the Ottoman period. In the sixteenth and seventeenth centuries, textile production was widespread at an advanced level. The fact that until the end of the empire the Ottoman economy was heavily dependent on textile industry. Having rapidly developed in the twentieth century, a great textile production capacity was created in Turkey between years 1923 and 1962. Extensive growth of the cotton in Turkey, the most important raw material of the textile industry, further contributed to the development of the textile sector. Until 1972, the sector gained

more strength due to the finalization of first planned development period. The period between 1980 and 1989 was witnessing opening to the foreign markets (Gülcan *et al.*, 2011).

The textile sector has made important contribution to the development of the clothing industry. In the 1990s, the share of textile sector within the total Turkish exports reached to 9.3 percent, showing a high export performance. The industry, today, has become one of the most important components of the Turkish economy with its export value of 5.4 billion dollars. While the export value of the textile sector was 1.1 million dollars in 1990, it has reached to 5.4 billion dollars by the end of 2009. In other words, total textile exports of Turkey folded five times within the last 20 years (ITKIB, 2009).

Textiles and clothing are among the most important industries of the Turkish Economy and foreign trade. Accounting for about 6-7 percent of the GDP together, these two industries are among the core of Turkish Economy in terms of GDP contribution, share in manufacturing, employment, investments and macroeconomic indicators. These industries had an 18.5 percent share in total export volume in 2011. There are more than 40,000 textile and clothing companies in Turkey with an estimated workforce of 750,000 internal customers.

Turkey is one of the main actors in the world of clothing industry, ranking 8th in world cotton production and 4th in world cotton consumption. Turkey also ranks 3rd in organic cotton production after India and Syria. Turkish clothing industry is the 6th largest supplier in the world, and the 2nd largest supplier to the EU. It has a share of 4 percent in knitted clothing exports and ranks 5th among the exporting countries. With a share of 2.6 percent, Turkey ranks 10th among the woven clothing exporters in the world. Turkish textile and clothing industries have a significant role in world trade with the capability to meet high standards, and can compete in international markets in terms of high quality and a wide range of products (www.tcp.gov.tr).

4. Methodology

In order to achieve a proper understanding of the concept and a concrete evaluation of the above-mentioned purpose, a questionnaire was constructed and used in this study. Consequently, QFD technique was applied to provide details on what aspects to improve and insights on their potential effects for internal customer satisfaction in textile industry in Turkey.

4.1 *The study*

A retail company from textile industry with a big market share in Turkey was selected as the sampling frame of this study to translate the internal customer expectations and needs into quality management characteristics. The company has been managing chain stores rendering service to millions of people from all walks of life through 370 stores and 71 cities. According to the reports indicating the consumption index of ready-made clothing prepared and published by a research company every six months, it has been keeping the leading position in the industry since Summer of 2004. The respondents were the internal customers of the company. A total of 32,938 questionnaires were distributed both manually and online, and usable 24,551 of them were received, comprising a response rate of 77.31 percent.

4.2 *Survey instrument*

A survey was conducted to measure the factors affecting the satisfaction of internal customers in the sample. To enable this study, the survey instrument used is the

SERVQUAL five dimensions model, adapted as recommended by Parasuraman *et al.* (1985). The SERVQUAL-type of questionnaire for use in the textile company is constructed by retaining some items from the updated SERVQUAL dimensions. Selected items were refined and paraphrased as appropriate for this research.

The questionnaire was designed in five-point Likert-type scale, yielding responses to items ranging from “never” (1) to “always” (5). The results of the questionnaire were then used to transfer the findings from the SERVQUAL instrument into QFD to figure out the factors affecting internal customer satisfaction. Gonzalez (2001) stated that QFD suggests two basic areas to improve: communication of customer requirements throughout the firm, and completeness of specifications to make them accountable directly to customer requirements and needs.

In addition to the above-mentioned improvement areas, QFD has other benefits: it can help in making trade-offs between customer requirements and what company can afford to produce; strengthen teamwork among engineers in departments; increase internal customer satisfaction (by taking customers’ requirements into consideration and bringing them into the product development process); shorten the time to market; encourage internal customers to provide sufficient documentation because they see the importance of information; and improve effective communication between company departments (see Sullivan, 1986; Hauser and Clausing, 1988; Zairi and Youssef, 1995; Chan and Wu, 2002; Terninko, 1995).

5. Analysis and findings

The findings from the application of QFD to internal customer satisfaction are depicted by the house of quality (HOQ) diagram, resembling a house, which is used for defining the relationships between customer desires and the company capabilities (shown in Figure A1). It is part of QFD, which represents a correlation matrix to relate customer expectations to describe how a firm is going to meet those expectations. Application of QFD is described in step by step as follows:

Step 1: the first output of the survey is a list of customer requirements. Customer requirements are defined according to the data collected from the survey explained above. There are ten customer requirements determined for this research, which include physical work environment, services, training and development, promotion and carrier path, customer’s attitude to job and company, company values, policies and strategies, recognition and reward, remuneration, and management style and effectiveness. They are listed along the left side of the matrix of the HOQ diagram in the Figure A1.

Step 2: in this step, technical requirements related with customer expectations are determined and explained. Technical requirements are important for QFD analysis since engineers and experts consider these requirements when they struggle to meet the customer requirements/expectations. To determine the requirements, experts from different departments have to work together. Technical requirements determined for this research are politeness, availability, competence, process communication, solution focus, planning and time management, openness to feedback, internal customer focus, adaptation to change, reliability, ethical and fair attitude, flexibility, continuous improvement, following technology, environmental friendliness, and occupational health and safety. After understanding all of the customers’ needs and expectations, they have to be rated by the experts over 9.

Step 3: after determining the technical requirements, experts construct relationships between customer expectations and technical requirements. Importance ratings and direction of improvement are other crucial points for QFD analysis. This information is

evaluated and determined by experts. Furthermore, engineers and experts at the company defined customer expectations in relation to specific technical requirement(s). All relationships are categorized such as either strong, medium or weak. The score of 9 indicated a strong relationship between customer expectations and technical requirements. The score of 3 signified a moderate relationship and 1 referred to a weak relationship between them (Camgöz-Akdağ *et al.*, 2012, 2013).

Step 4: in this step, experts calculate the importance degree of each customer requirement. First, there is a need to calculate the weight and importance degree of each customer requirement. These values were calculated from the results of the survey applied to the internal customers. As the questionnaire was formed using five-point Likert-type scale, the response to each question gives the importance degree for each related customer requirement. Relative weight of each customer requirement is the percentage of each customer requirement based on its importance among all customer requirements (Camgöz-Akdağ *et al.*, 2012, 2013). Next, the technical importance degree shown at the lower level of the HOQ diagram was calculated for each technical requirement as summation of the importance degree of customer requirement related with the technical requirement multiplied with the weight of relationship. The formula is as follows:

$$\sum \text{Technical importance degree} = \sum (\text{Importance degree of customer requirement} \\ \times \text{Weight of customer requirement})$$

Step 5: maximum relationship degree shows the degree of relationship between the customer requirement(s) and technical requirement(s). This is the matrix shown in the center of the HOQ diagram. If no relationship is found between customer requirement and technical requirements, the components of customer requirements were deleted from the matrix. Directions of improvement for technical requirements were symbolized with upward triangle, downward triangle or circle. Upward triangle showed the areas that need improvement by improving the relationship, while downward triangle showed for improvement, one should decrease a technical requirement. If it is concluded that there is no need for improvement, then that requirement direction of improvement was shown with a circle (Camgöz-Akdağ *et al.*, 2012, 2013).

Step 6: in addition to the information above, there can be relationships between technical requirements themselves. Improvement for one technical requirement can also indirectly or directly affect another technical requirement positively or negatively or vice versa. The correlations among technical requirements are described via a correlation matrix, which also forms the roof of the HOQ. Two different symbols are used in the correlation matrix to illustrate the relationship. For a strong positive correlation a single positive symbol (+), for a strong negative correlation a negative symbol (–) is used. After the relationship is figured out among technical requirements the symbols are placed on the roof of the HOQ matrix. The matrix illustrates which technical requirement has positive or negative correlation with other technical requirements. QFD method should be considered with the relationships among technical requirements since these correlations affect the improvement process.

As mentioned in the literature, this approach helps identify the minimum set of technical requirements of the company to meet the various customer requirements, in turn leading to a cost-effective means of improving quality – quality as perceived by the customers.

Application of QFD to internal customer satisfaction in our sample of respondents in the large textile company is shown in the HOQ figure (Figure A1). The HOQ illustrated in the Figure A1 to this study shows the customer requirements, technical requirements, maximum relationship degree, relative weights of relationships, improvement directions and correlations among technical requirements. First, it could be observed that there are strong correlations between technical requirements of availability, internal customer focus, environmental friendliness, occupational health and safety with the customer requirement of physical work environment. Second, technical requirement of internal customer focus is strongly correlated with the customer requirements of physical work environment, services, training and development, internal customers attitude and company values. Third, we observe strong correlations between technical requirements of competence and openness to feedback and the customer requirement of training and development. In addition, weak correlations can be observed between technical requirements of availability, process communication, planning and time management, adaptation to change, continuous improvement and customer requirement of training and development.

The relative weight score represents the percentage of an individual technical requirement's weight of the total weight, calculated by importance weight divided by the total weight. When the relative weight row in HOQ is analyzed, it is observed that internal customer focus has the highest weight score, which states that when internal customer focus is improved there will be almost 12 percent of improvement in internal customer satisfaction in the company. The second highest relative weight score is calculated to be the politeness which states that an improvement in politeness will improve satisfaction by 9 percent. The third highest relative weight score is equal to the second highest relative weight score of 9 percent, which relates to process communication. The fourth-highest relative weight score is related with the technical requirement availability as it has a score of 8 percent, which states that when availability is improved, there will be almost 8 percent of improvement in the internal customer satisfaction level. When there are improvements in these four technical requirements, the company will improve and satisfy the internal customers by a total of 38 percent. The managers of the company can also make use of other areas of improvement suggested by the HOQ in order to increase the satisfaction level of internal customers.

The correlations among technical requirements indicate that politeness is positively related with availability, competence, solution focus, openness to feedback and internal customer focus. Availability is positively correlated with competence, process communication, openness to feedback, internal customer focus, adaptation to change, ethical and fair attitude and following technology. On the other hand, availability is negatively correlated with solution focus. This finding could sound as reasonable, as effective solutions will not be available if there is nobody in the company to address the problems. Competence has strong correlations with process communication, planning and time management, openness to feedback, internal customer focus, adaptation to change, ethical and fair attitude, continuous improvement, environmental friendliness, and occupational health and safety. It is also negatively correlated with solution focus. From this finding, it could be inferred that it is not possible to be solution focussed without the necessary skills. Process communication has strong relationships with solution focus, planning and time management, internal customer focus, adaptation to change, reliability and a negative relationship with occupational health and safety. Solution focus has strong positive correlations with internal customer focus and continuous improvement.

On the other hand, in addition to others mentioned above, it is negatively correlated with planning and time management, adaptation to change and reliability.

Furthermore, technical requirement of planning and time management is observed to be positively correlated with internal customer focus adaptation to change, ethically and with fair attitude, flexibility and continuous improvement. Openness to feedback is positively correlated with internal customer focus, continuous improvement, following technology, environmental friendliness and occupational health and safety. Internal customer focus among others also positively correlated with adaptation to change, reliability, ethical and fair attitude, flexibility, continuous improvement, following technology, environmental friendliness and occupational health and safety. Adaptation to change is positively related with ethical and fair attitude, flexibility, continuous improvement, following technology, environmental friendliness. Technical requirement reliability has positive correlations with ethical and fair attitude, continuous improvement, environmental friendliness and occupational health and safety. Ethical and fair attitude is positively correlated with continuous improvement and environmental friendliness, flexibility with continuous improvement, following technology and environmental friendliness. Continuous improvement is positively related with following technology, environmental friendliness, and occupational health and safety. Following technology has a positive correlation with environmental friendliness and environmental friendliness is positively related with occupational health and safety in addition to others mentioned above.

The correlations among the technical requirements themselves could suggest that any potential improvement in a technical requirement has a potential to improve the technical requirement(s) that it is correlated with.

6. Discussion and conclusion

This paper has employed QFD method for translating internal customer requirements/expectations into appropriate service specifications to perform process assessments in relation to the quality characteristics for increasing the motivation and satisfaction of the internal customers of textile industry. In addition, the paper shows how an existing approach of SERVQUAL and QFD integration can be applied to the textile industry context. Being among the first attempts to apply this integrative approach to a different industry and thus offering practical and applied information, it will be valuable for both academics and professionals in this industry specifically in Turkey. From a methodological perspective, the ability of correlating technical requirements with customer requirements makes this approach a useful tool for textile industry like others.

In order to stay competitive, designing technical requirements in accordance with customers' expectations or requirements has become an increasingly important necessity for textile companies. In this context, this approach provides textile companies an understanding of their service quality levels from the internal customer's perspective. Moreover, highlighting the most important internal customer requirements, it helps textile companies develop innovative ideas at both strategic and tactical levels.

We found strong correlations among technical requirements of availability, internal customer focus, environmental friendliness, occupational health and safety with the customer requirement of physical work environment. The findings also pointed to a strong correlation between technical requirement of internal customer focus and customer requirement of services. It could also be observed that there are strong correlations among technical requirements of competence, openness to feedback, internal customer focus and the customer requirement of training and development.

In addition, although weak, customer requirement of training and development was correlated with technical requirements of availability, process communication, planning and time management, adaptation to change and continuous improvement.

QFD gives specific information by providing the percentage of each technical requirement's effect on customer satisfaction when the relative weight column is analyzed. In this context, it could be inferred that internal customer focus has the highest weight score stating that when internal customer focus is improved there will be almost 12 percent of improvement in internal customer satisfaction. The second and third highest relative weight scores are calculated to be 9 percent, related with technical requirements of politeness and process communication, which suggests that improvements in the company with respect to politeness and process communication will improve the satisfaction level by a total of 18 percent. The fourth-highest relative weight score is related with the technical requirement availability as it has a score of 8 percent, suggesting that when availability is improved, there will be 8 percent of improvement in internal customer satisfaction. All four improvements are related to behavior and attitude toward internal customer and when they improve, the company has a potential to satisfy the internal customers by a total of 38 percent.

For further implications, QFD technique could be used to provide companies with a better understanding of customers' (internal or external) expectations and to, translate these expectations into appropriate service specifications and perform existing process assessments. Ease of applying this method in different industries points to its practical benefit and makes it desirable for textile industry as well. Finally, it is possible to replicate the studies with QFD in the already applied companies following the application of suggested improvements to assess the improvements in the satisfaction level to validate its utility.

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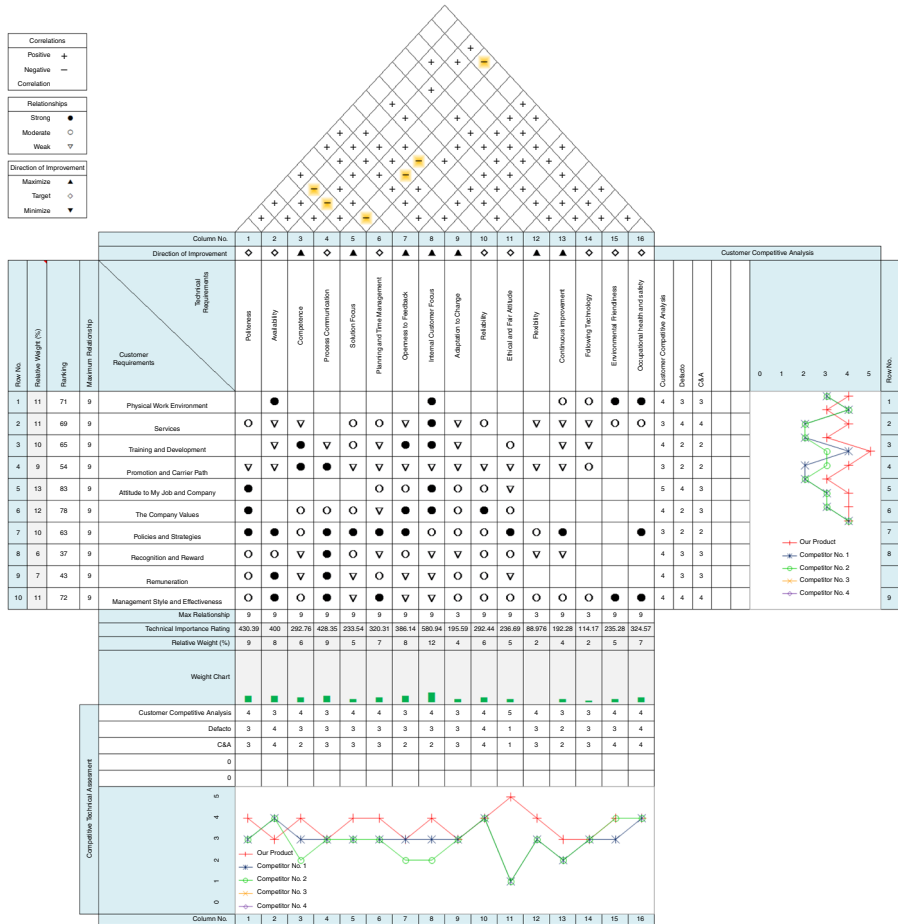


Figure A1. House of quality (HOQ) matrix for the sample

Note: n=24,551

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