International Journal of Academic Research in Business and Social Sciences
April 2016, Vol. 6, No. 4
ISSN: 2222-6990

Quality Function Deployment and an Application in an Insurance Company

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DOI: 10.6007/IJARBSS/v6-i4/2085 URL: http://dx.doi.org/10.6007/IJARBSS/v6-i4/2085

Abstract
At the present time, as a result of rapid development in technology and increasing competitive circumstances, product and service businesses need to implement new approaches in order to be sustainable and successful. Quality Function Deployment (QFD) is a process which identifies customers' needs and requirements correctly, ensures the provided product or service is planned and designed in order to fulfill them and in this way, provides customer satisfaction. Aim of this research is to investigate the applicability of implementation of the QFD approach in a company in insurance sector. In the study, expectations of customers from insurance companies are investigated by using a questionnaire towards QFD and house of quality for insurance company is built. At the end of the research, price is observed to be the most significant factor, for customers that an insurance company should have. Besides, a number of suggestions have been made to the company that can increase customer satisfaction and provide competitive advantage.
Keywords: Quality, The Quality House, Quality Function Deployment, insurance, voice of the customer.
JEL Codes: M10, L15, M11

1. Introduction

Industrialization, which started from infancy at the end of the 17th century, reached the phase of automation through technological developments which gained speed in the 18th and 19th centuries (Kecek, et al., 2010). Total Quality Management is a management philosophy which provides continuous improvement of business processes with the participation of all employees throughout the organization in order to show performance that will fulfill or overcome the "quality" expectations of the customers (Yıldız & Baran, 2011).

[*] This study is converted from a Master's Thesis titled "Quality Function Deployment Application in an Insurance Company" written by Ömer Can AKINCI and supervised by Assoc. Prof. Dr. Gülnur KECEK.

Total quality management is a modern management approach that aims to perpetuate perfection based on zero error principle throughout all processes with the participation of both internal and external business environment, gives prominence to human factor in managerial and organizational structure with continuous education and group work, aims to increase competitive capacity of business unit with continuous development principle and defends that all these are possible by only adapting a leadership understanding with the highest level of responsibility so that customers' needs, desires and expectation are met and perfection is achieved. For business units, surviving in the world markets with devastating competitive environments is only possible by adopting and applying a quality understanding (Öztürk, 2009; Bolat, 2000:26; Erol, 1994:18).

Studies about total quality has increased, especially after World War II. Japanese, devastated in the war, tried to regain power benefiting from especially American scientists. To this end, operations about total quality are focused on by inviting scientists such as Deming, Feigenbaum and Juran (Çinpolat, 2007).

TQM assures that important processes are managed based on QFD and concurrent engineering so that new products with high quality are supplied to appropriate customers in appropriate amounts in the right time and in the best way possible. In order to establish TQM, QFD forms a basis. According to TQM literature, creating quality starts with asking "what the customers want". QFD is an important tool that can be used to answer that question. QFD process ensures to reach total quality objectives by spreading "voice of the customer" throughout the organization vertically and horizontally. QFD also determines how the company will meet and surpass the customer needs by including "voice of the company" into the process design along with "voice of the customer". QFD is a must for a successful TQM program (Yenginol, 2000:15; Akıncı, 2012).

2. Quality Function Deployment and Its Development

QFD was employed for the first time in Kobe shipyard site of Mitsubishi by Akao in 1972, then Toyota and its suppliers used and developed it furtherly in a case to prevent rust. (Akao, 1990; Halog, et al., 2001).

First publication about this work was the article titled "Development and Quality Assurance of New Products: A system of Quality Deployment" published in the monthly journal "Standardization and Quality Control" in 1972 (Yenginol, 2008:8).

After its introduction in the USA in early 1980s, Quality Function Deployment has expanded widely in several industries in the Western world. Companies such as Ford Motor Company, Procter and Gamble, Campbell's soup, IBM, Xerox, Hewlett-Packard, Kodak, and 3M Corporation are early employers of QFD method (Cohen, 1995; Griffin & Hauser, 1993; Kahraman et al., 2006:390). Retail outlets, apartment layouts, cars, computers, software, printers, cameras, airline services, paints, surgical instruments, diagnostic instruments, office equipment, consumer products, tools, retirement plans, movie theatres, health insurances, financial services, telephone services, gas and electrical services, distribution networks are some examples of products and services which are developed with the help of QFD (Benner, et al., 2003). Number of companies using QFD started to increase as the method became more recognized in Turkey. In Turkey, QFD was applied for the first time by Arçelik, a home appliance manufacturer, on a washing machine in 1994 (Doğan, 2000:67). Other than Arçelik; Tofaş, Cevher Mining Industry, BMC, Beko, Neta and Brisa are some examples of these companies. Interest in QFD increases every day in Turkey, as it does in

the world. Recently, about 50-100 companies are interested in QFD method (Akbaba, 2005; Arıcan, 2006:134).

Quality Function Deployment is a product and service development process in which the customer inputs are transferred to design, production and service by an interfunctional team of people using a set of matrices with the shape of a home (Doğan & Arıcan, 2008:108).

Cohen described QFD as "a structured production planning and development method that enables a development team to clearly understand customers' needs and wants and systematically evaluates the adequacy of each proposed product or service in meeting those needs and wants (Cohen, 1995:11).

QFD is a really efficient organized planning instrument to handle customer demands in a more methodical way and specify what the customer demands so that the business unit can do the right thing in the right time (Dikmen, et al., 2005).

According to Dr. A. V. Feigenbaum, Quality Function Deployment (QFD) is a quality system which involves organizational and functional procedures required to produce a product with the expected level of quality and presenting it to the market (Akao, 1988:12).

Fundamentally, this process covers the similar steps that people have already been doing but it creates a systematic construction, rather than unstable and instinctive managerial process, which is based on the organization's available knowledge and experience. In this respect, QFD creates a ground for organizational training (Govers, 2001). According to the literature, using QFD has reduced design time by 40% and design costs by 60% (Benner, et al., 2003).

QFD is transforming customer requirements into proper technical specifications and production process information with sufficient capacity (Okudan, 1999:304).

Based on these definitions, Quality Function Deployment can be defined as "a detailed, structured but also flexible and easy-to-understand method which is applied in product and service development by an interfunctional team of people in order to ensure that customers' expectations, needs and unperceived desires are defined and those expectations, needs and desires are transformed into product and service features throughout all organization's functional components" (Taş, 2006:3).

Quality Function Deployment method has been employed intensively in service industry, especially in Japan and the USA (Öter & Tütüncü, 2001). In particular, there have been some in-depth academic studies about several subjects in service industry such as banking, catering, retailing, police departments, health, education, travel agencies and hotels (Kılıç & Babat, 2011).

In their study on institutions providing health service, Dijkstra and Van der Bij (2002) emphasized the importance of health insurance services among other customer expectations.

Hepler (2008) used QFD and AHP methods together in order to structure the health insurance plans that will be used by Blue Cross Blue Shield company. Doğu and Özgürel (2008) used QFD method on private pension system. In their study, technical specifications to which a standard insurance company should pay attention, and develop are determined in order to satisfy the expectations of two customer groups, members of private pension system and potential members.

QFD is used in many areas such as TQM, Strategic Product Development, Organizational Planning, Cost Deployment, and Software Development (Cohen, 1995).

According to Griffin and Hauser (1993), QFD was applied by more than a hundred of US companies in 1991. In earl application, QFD showed exceptional outcomes with 60% decline in design expenses and 40% decline in design time (Hauser & Clausing, 1988).

Factors Forming The Quality Function Deployment Concept

QFD is a planning process helping the business unit to effectively use other technical tools to assist and complete each other and defining matters with priority. QFD is also helpful to obtain a customer focus and to identify customer cases in which a teamwork or special tools can be useful (Arıcan, 2006:116).

Some important factors that forms QFD concept are listed below (Day, 1998:8):

- QFD is a not a tool to solve or analyze problems but a planning process.
- Customers' needs and desires are inputs for the matrix. Process cannot be initiated without these inputs. Basically, QFD forces an organization to get in touch with people who use its products. A matrix is used to display information vital for the project in a brief format.
- Information presented in a matrix, makes the investigation, cross check and analyzing processes easier and helps the business unit to identify competitive objectives and matters with priority that require action.
- The output that is obtained as a result of QFD matrix analysis has two points; competitive objectives to perform important actions related to customers' thoughts are identified and certain matters that require special attention are pointed out. If objectives and those certain matters are dealt effectively, customer satisfaction will increase considerably.

QFD ensures that product specifications are determined and advanced product development stages, including production stage, are directed and performed by customer. Even though first QFD applications were used in new product development, QFD process will contribute to all fields that require elaborate customer expectations to be defined and associated with production processes. Besides; it is possible to benefit from QFD in designing market research, making plant location decisions and business planning processes. Additionally, QFD has been employed more and more by transportation and communication, electronics and electrical utilities, software systems, manufacturing, services, education and research, and many other industries along with aerospace, construction, packaging and textile (Delice & Güngör, 2009).

Advantages Provided to Business Units by Quality Function Deployment and Its Weaknesses

Quality Function Deployment is a customer-oriented process. QFD goes beyond usual customer feedbacks and tries to define basic requirements by comparing all existing information about competition. Therefore, all competitors are evaluated from customers' aspect and technical aspect. With the help of this information, requirements are put in an order of priority so that administrators attempt to allocate their limited sources in the most significant way in terms of customers' demands (Sofyalıoğlu, 2006:38; Delice & Güngör, 2008).

Quality function deployment is an effective way of ensuring goal congruence in a business unit. QFD is not a only tool for quality but also a planning tool to develop new products and make innovations in existing products (Okul, 2007:32).

Quality Function Deployment (QFD) put information and experience to use together. Creating new specifications during the project applying process and integrating these specifications into the process accelerate to obtain a result. In addition, QFD's not having a strict structure and being able to include new information in the project even during the application process provide a major advantage for the business unit (Şen & Yenginol, 1998:3).

Using QFD methods can provide major advantages to a business unit. Main advantages that can be gained from employing the QFD method are (Sularto, et al., 2015):

- *Focusing on the customer.*
  QFD necessitates data and feedback from consumers. So that, this information can be converted into particular consumer specifications.
- *Effective use of time.*
  QFD can shorten development time of a product since it concentrates on particular consumer specifications which have been precisely described.
- *Introduction of teamwork.*
  QFD is a method employing teamwork. All conclusions are reached in unity after the process of detailed and deliberate conversations between departments. Accordingly, every activity that has to be involved in the process requires and encourages teamwork.
- *Documentation oriented.*
  QFD method provides an extensive document on which all the required data about current process and comparisons with customers' specifications can be found. This report is continually being adjusted when a new datum is inserted and an old one is eliminated. Recent information about customers' specifications is especially significant in case of a revision in the project.

Since QFD is performed in the light of information obtained from customers and functional managers via market research, it is possible to fail at gathering reliable data as a result of using wrong research methods and non-objective reasons (Babat & Kılıç, 2011:96).

Öter and Tütüncü (2001) explained weaknesses of QFD as follows: "It requires caution at the beginning of the process, it is costly to start over after the production process began, it demands a high level of corporate culture, it requires staff capable of using interdisciplinary information, it blends technical language and social language and in some cases it is difficult to concentrate on when it is required to associate a large amount of data in the matrices" (p.101).

3. Application Process of Quality Function Deployment

Quality function deployment is a progressive process and consists of four stages (Cohen, 1995; Akıncı, 2012):

Stage 0: Planning
Stage 1: Gathering the "Voice of the Customer"
Stage 2: Building the House of Quality
Stage 3: Analyzing and Interpreting the Results

3.1. Planning Stage (Stage 0): Planning stage includes assuring organizational support, defining the project's objective, scope and subject, determining the customer group,

preparing the implementation plan, determining the product concept, establishing QFD team and providing necessary materials and facilities (Cohen, 1995:214).

3.2. Gathering the "Voice of the Customer" (Stage 1): Nowadays, many companies work up to expand their competitive boundaries in global markets where customer demands change rapidly as a result of technological innovations. These companies realized that they need to recognize and fulfil customers' need and demands as much as possible so that they can present innovative products and value added services to the market. Survival of the company is dependent on its ability to define new customer needs, to develop improved products and services and to market them (Shen, et al., 2000).

Quality Function Deployment has three main aims (Çinpolat, 2007):

- Defining who the customers are,
- Understand what the customers want,
- Determine how to fulfill the customers' desires.

Organizations can exist as long as they please their customers. Increasing the value of the customer is possible by increasing the quality of the service provided to the customer. In a customer-oriented business unit, it can be declared that the quality of the product and service can be defined by the customer (Dereli & Baykasoğlu, 2003:60).

In order to gather the customers' opinions, questionnaire studies, generally the most effective way, are employed. In order to gain new customers and to retain old ones and increase their loyalties, customers and their expectations should be comprehended in the first place (Dereli & Baykasoğlu, 2003:63).

3.3. Building the House of Quality (Stage 2): QFD methods employs a matrix called House of Quality which is used to convert the voice of customers into the process which will eventually produce product or services that is suitable for customers' expectations, while ensuring the participation of managerial capacity of the organization (Sularto, et al., 2015).The process of building the house of quality is carried out by a team of experts from a wide range of fields in order to transform a series of customer desires, gathered by market research and data comparisons, to a reasonable number of prioritized engineering objectives to be met with designing a new product or a service (Hauser & Clausing, 1988:63).

House of quality summarizes different steps of planning stage. Throughout this stage, customer requirements are transformed into design characteristics based on past experiences and market research (Govers, 2001).

QFD consists of the combination of four matrices (customer requirements matrix, deployment of product characteristics matrix, process and quality control matrix and operational instructions matrix) (Ertuğrul & Aytaç, 2007). The house of quality comprises of various segments and every one of them has to be built into the house in a specific order. Customer needs have to be determined and put into left part of the house (Step 1). Then, customer needs have to be prioritized and put in an order of importance (Step 2). In this step, competitive analysis regarding the customer needs determined in the first step is also done. Finally, decision makers should determine the managerial requirements and service design in related departments throughout the organization (Jeong & Oh, 1998).

House of quality matrix built in the application of QFD has two significant sections. In the horizontal axis, there is customer section in which information about customers is presented and in the vertical axis there is technical section which responds to customer information (Savaş & Ay, 2005:84).

Customer requirements matrix is generally known as house of quality. In Figure 1, house of quality can be seen (Halog, et al., 2001).

Toyota succeed in reducing their design costs by half and their development time by a third after implementing QFD method. Marsot (2005) employed the house of quality to design a boning knife. Haapalainen (1999/2000) used HoQ in the evaluation of pruning shears. It is also employed by Kuijt-evers, Morel, Eikelenberg, and Vink (2009) as a design method to assure comfort in screwdriver design. Lo, Tseng, and Chu (2010) proceeded with One-step QFD to generate a computer mouse design concept (Zhang, et al., 2014).

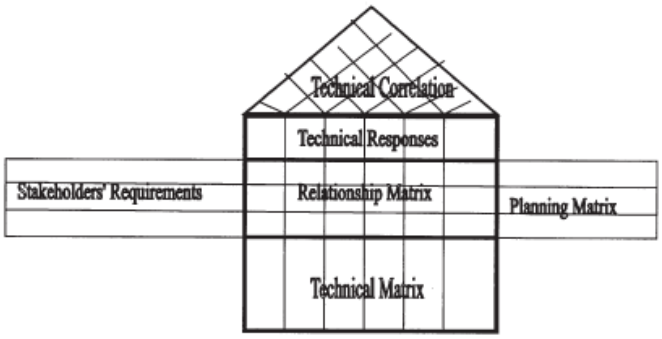


Figure 1: House of Quality
Source: Halog, et al., 2001, p.388.

The House of Quality is the most significant principle of QFD method. The house includes seven essential procedures: (1) determine the customers' desires, (2) determine technical specifications (translations) of the desires, (3) associate the desires with technical specifications, (4) identify and evaluate the competitive product, (5) describe technical specifications determined in step 2 to signify any correlation, (6) assess technical specifications and acquire targets, and (7) identify which technical specifications to use during the rest of the process(Halog, et al., 2001; İçtenbaş & Eryılmaz, 2011; Zhang, et al., 2014).

3.4. Analyzing and Interpreting the Results (Stage 3): Completing the QFD matrix, the business unit is now determined the extent of its fulfilment of its customers' requirements and expectations, its competitive status in the market and technical characteristics that will fulfil customers' requirement and expectations. After gathering this data, the business unit should make improvements as steered by QFD matrix by using its resources in a productive way. The objective is to define priorities by comparing the business unit with customer requirements and desires to fulfil them and make necessary improvements accordingly (Shillito, 1994:137).

4. An Application of Quality Function Deployment in an Insurance Company

In this study, Quality Function Deployment will be applied to a service business. Accordingly, ways of production are investigated so that the business unit will provide a better quality service to fulfil customers' expectations and its difference from the best competitor is defined.

In the process of selecting sector in which the application will take place, insurance sector that has an increasing importance both in our country and in the world is selected

and in the process of selecting the company, a company that tries to survive in a changing competitive environment is chosen. QFD process is applied in the selected company and validity of QFD process in the company is studied. Data used in this study is gathered from customers, company's staff and managers via questionnaire and interview.

The selected company is referred as "Insurance Company A" in the study. Insurance Company A has been in service with domestic capital since 1936. Insurance Company A has an open-minded, innovative and contemporary way of understanding. It is a pioneer company in insurance sector with its knowledge and experience, expert staff, organizational structure and advantages coming from its economic strength. Insurance Company A has designated its core values as honesty, flexibility, customer-oriented, team spirit, continuous development and transparency.

The steps of building the house of quality related Insurance Company A are explained.

4.1. Building the Customer Desires Section

Building the customer desires section, determining customers' needs and desires, prioritizing the customers' needs and desires, customers' complaints and comparing the product with rival products are the section located in the customer information section of the house.

In the application, "Focus Group Discussion" technique is employed to determined customers' needs and desires. Main objective of the focus group discussion technique is to understand customers' thoughts and understandings about a specific subject in detail and in depth. Focus group discussion is conducted with people selected from different education level, culture and functions (Akıncı, 2012). In the discussion, characteristics such as technological infrastructure, honesty and transparency about the insurance policy, appearance of the insurance policy, payment of the refund in a short time after the damage, easy terms of payment for insurance policy, attention and attitude of the agency, attention of the company after the damage and brand value of the company were determined as significant. Accordingly, most important customer desires for "Insurance Service" are recognized and can be seen in Table 1.

Table 1. Significance Levels of Customer Desires

Service Characteristics	Customer Desires	Significance Level
Price	Reasonable Price	4,22
Payment	Payment of the Refund in a Short Time	4
	Easy Terms of Payment for Insurance Policy	3,95
Reliability	Honesty in Insurance Policy	3,66
	Popularity (Brand Value)	3,57
Customer Relations	Attitude of the Agency	3,97
	Attitude of the Company After Damage	4,14
Technology	Technological Infrastructure	2,90
Appearance	Appearance of the Insurance Policy	2,85

4.2. Making Competition Comparison for Customer Desires

Out of all companies in the sector, a rival company that has a big market share and a domestic capital is chosen and will be referred as "Insurance Company B" in the study.

Questionnaire method is used once more to make comparison between Insurance Company A and Insurance Company B. Participants are asked questions about how good are Insurance Company A and Insurance Company B about technological infrastructure, honesty in insurance policy, appearance of the insurance policy, payment of the refund in a short time, easy terms of payment for the insurance policy, attitude of the agency, attitude of the company after damage and brand value of the company. Participants are asked to value the companies between1 to 5. '5' is valued as 'Very Good', '4' is valued as 'Good', '3' is valued as 'Normal', '2' is valued as 'Bad' and '1' is valued as 'Very Bad'. Comparisons between Insurance Company A and Insurance Company B are shown in the Table 2.

$$n = \frac{Nt^2pq}{d^2(N-1)} + t^2pq$$ (Baş, 2006:47)

N: Population size
n: Sample size
p: Proportion of attributed population elements
q: Proportion of unattributed population elements
t: theoretical value according to table for a significant level
d: Sampling error accepted according to proportion of attribution.

Insurance Company A indicated that it has 400.000 customers in total. According to the sampling size calculations using the formula above at confidence level of 95% and with a margin error of ±5%, it is calculated that 247 questionnaires have to be applied. A total of 250 questionnaires are applied to randomly selected customers. Results are shown in Table 2.

Table 2. Fulfilling Customer Desires

Service Characteristics	Customer Desires	Insurance Company A	Insurance Company B
Price	Reasonable Price	2,84	4,41
Payment	Payment of the Refund in a Short Time	2,89	4,30
	Easy Terms of Payment for Insurance Policy	2,98	4,38
Reliability	Honesty in Insurance Policy	3,24	3,89
	Popularity (Brand Value)	2,84	4,68
Customer Relations	Attitude of the Agency	3,78	4,10
	Attitude of the Company After Damage	3,17	4,60
Technology	Technological Infrastructure	3,13	3,70
Appearance	Appearance of the Insurance Policy	3,08	3,76

4.3. Building the Planning Matrix and Analysis

Planning matrix built for Insurance Company A is shown in Table 3 below. Planning matrix shows the value of customer desires from the aspect of competitors, company and customers. In the "Expected Quality" column, there are scores showing how the company wants to see itself in the market. Determining the scores in "Expected Quality" column, authorities from the company are clearly informed about questionnaire results applied to the customers.

Table 3. Analysis of Customer Satisfaction Levels

Service Characteristics	Customer Desires	Significance Level	Insurance Company A	Insurance Company B	Expected Quality	Progress Rate	Sales Advantage	Absolute Weight	Relative Weight (%)
Price	Reasonable Price	4,22	2,84	4,41	4,22	1,48	1,5	9,36	0,17
Payment	Payment of the Refund in a Short Time	4	2,89	4,30	4	1,38	1,5	8,28	0,15
	Easy Terms of Payment for Insurance Policy	3,95	2,98	4,38	3,95	1,32	1,2	6,25	0,11
Reliability	Honesty in Insurance Policy	3,66	3,24	3,89	3,66	1,12	1	4,39	0,08
	Popularity (Brand Value)	3,57	2,84	4,68	3,57	1,25	1,2	5,35	0,10
Customer Relations	Attitude of the Agency	3,97	3,78	4,10	3,97	1,05	1	4,16	0,07
	Attitude of the Company After Damage	4,14	3,17	4,60	4,14	1,30	1,2	6,45	0,12
Technology	Technological Infrastructure	2,90	3,13	3,70	3,13	1,01	1	2,92	0,05
Appearance	Appearance of the Insurance Policy	2,85	3,08	3,76	3,08	1,01	1	8,77	0,15
Total								55,93	100

"Progress Rate" column is calculated by dividing "Expected Quality" column by company's current status.

In the "Sales Advantage" column, it is shown that in case of making an improvement in customer desires, to what extent it will effect sales. Responsible managers of the company are asked how one unit of increase in criterion will result in. They are required to respond with "1" for no progress, "1,2" for middle level of progress and "1,5" for high degree of progress.

"Absolute Weight" column is calculated by multiplying "Significance Level", "Progress Rate" and "Sales Advantage" columns. A high score of absolute weight will increase sales and also will create customer satisfaction.

"Relative Weight (%)" designates the percentage of significance levels of each customer desire in total of all customer desires. Absolute weight of each customer desire is calculated by dividing it by the sum of absolute weight column.

4.4. Defining Quality Characteristic and Analyzing Them

In order to determine customer needs and desires, they need to be specified as technical requirements. Open-ended questionnaire is applied with experts in order to determine quality characteristics.

In accordance with answers, a quality characteristic is defined for each customer desire and shown in Table 4.

Table 4 Quality Characteristics

Service Characteristics	Customer Desires	Quality Characteristics
Price	Reasonable Price	● Following the pricing policies of leading companies ● Specialty based benchmarking studies
Payment	Payment of the Refund in a Short Time	● Communicating customers to obtain missing documents ● Completing all the information in damage file (Instructing agencies to enter the data correctly and completely)
	Easy Terms of Payment for Insurance Policy	● Agreements with banks ● Making installments ● Advantages for in advance payments
Reliability	Honesty in Insurance Policy	● Preparing the insurance policy complying with general requirements ● Stating the given warranties to the customer clearly and explicitly
	Popularity (Brand Value)	● Representative visits (Agency, service station and customer visits)

		● Advertisement in local press ● Advertisement campaigns in national press
Customer Relations	Attitude of the Agency	● Continuous trainings, meetings and seminars ● Elaborate investigations in selecting new agencies
	Attitude of the Company After Damage	● Immediate direct solution upon damage notice (Assistant, medical help, residence repair) ● Constant communication to resolve conflicts of compensation after damage.
Technology	Technological Infrastructure	● Continuous R&D activities of Information Technology Department ● Projects to enable interactive inquiries of procedures after damage
Appearance	Appearance of the Insurance Policy	● Using fonts to make the insurance policy more readable ● Emphasizing corporate identity (A design that features company's name and logo)

4.5. Building the Relation Matrix and Analyzing It

The relation matrix is shown in Table 5.

Table 5 Relation Matrix

Customer Desire	**Significance Level**	Following a pricing policy	Specialty based	Obtaining missing documents	Completing damage file info	Agreements with banks	Making installments	Advantages for in advance	Policy's compliance with	Stating the warranties clearly	Representative visits	Advertisement in local press	Advertisement campaigns in	Continuous trainings,	Meticulousness in agency	Direct solution upon damage	Constant communication	R&D activities	Interactive damage inquires	Readable fonts in policy	Emphasizing corporate	**Absolute Weight**
Reasonable Price	4,22	**Θ**	**Δ**			**Δ**		O										**Δ**				**9,36**
Payment of the Refund in a Short Time	4			**Θ**	**Θ**											O	O					**8,28**
Easy Terms of Payment for Insurance Policy	3,95	**Δ**				**Θ**	**Θ**	O														**6,25**
Honesty in Insurance Policy	3,66								O	**Θ**										**Θ**	O	**4,39**

Popularity (Brand Value)	3,57	**Δ**									O	**O**	**O**		**Δ**					O	**5,35**
Attitude of the Agency	3,97										O			**Δ**	**O**						**4,16**
Company's Attitude After Damage	4,14			O												**O**	**O**		O		**6,45**
Technological Infrastructure	2,90																	**O**	O		**2,92**
Appearance of the Insurance Policy	2,85										**Δ**									**O**	O	**8,77**
Absolute Significance		**95,84**	**9,36**	**93,87**	**74,52**	**65,61**	**56,25**	**46,83**	**13,17**	**39,51**	**37,30**	**48,15**	**48,15**	**4,16**	**42,79**	**66,33**	**66,33**	**35,64**	**9,37**	**118,44**	**55,53**	
Relative Significance (%)		**9,4**	**0,9**	**9,1**	**7,3**	**6,3**	**5,4**	**4,5**	**1,4**	**3,9**	**3,6**	**4,6**	**4,6**	**0,5**	**4,1**	**6,5**	**6,5**	**3,4**	**0,9**	**11,5**	**5,4**	

Meanings of symbols and numbers in Table 5 are listed below:

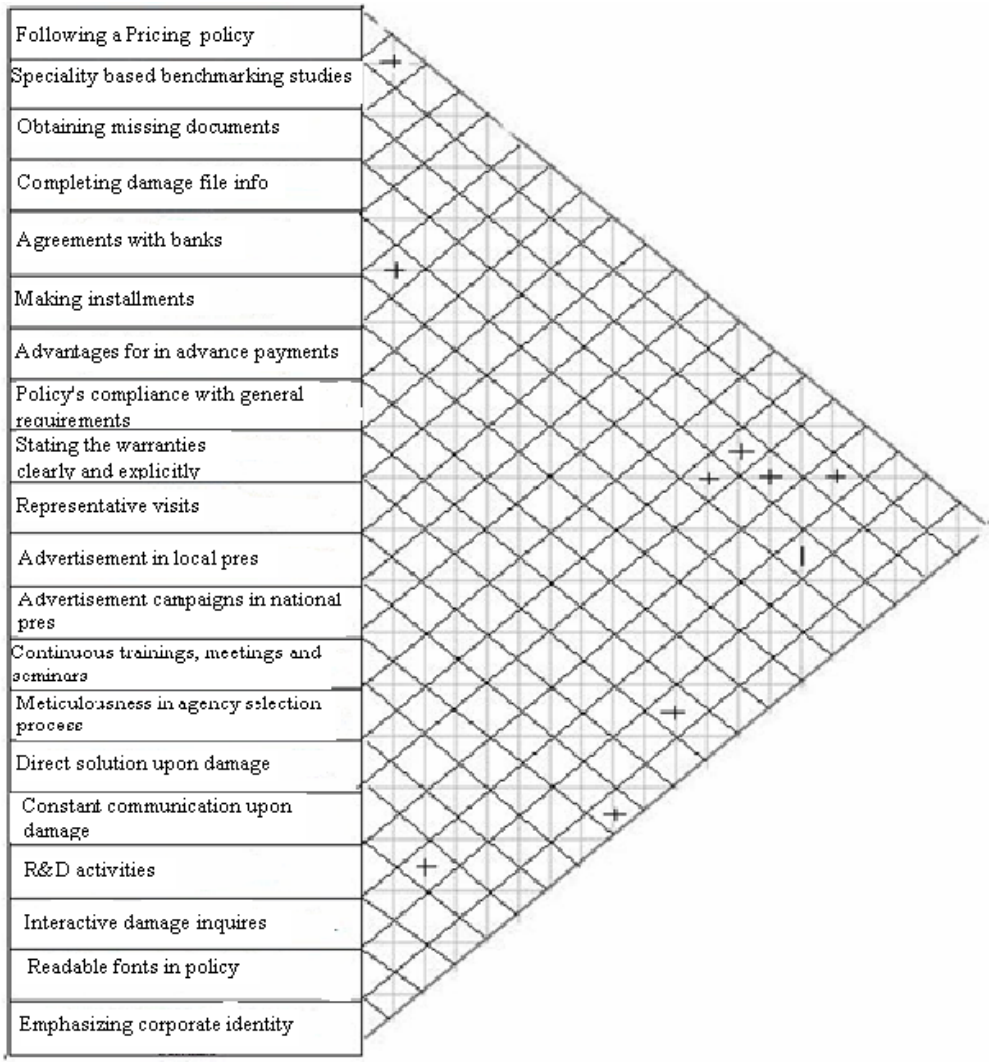
O : Strong relation, represented with number 9

O : Moderate relation, represented with number 3
Δ : Weak relation, represented with number 1
In case of no correlation in any of the rows, that row render the house of quality insignificant. Also, if there is a majority of weak correlations in the table, it is understood that customer desires are not fulfilled. In our study, there is no such evidence and it can be clearly seen that customer desires are fulfilled.

4.6. Making Technical Comparisons and Defining Objectives

In this stage, effects of quality characteristics that are relevant to customers desires are evaluated. Actually, many of quality characteristics are related to one another. Any work that is done to fulfil customer desires can be helpful to another quality characteristic or have a negative effect on it. These correlations are identified by company's experts. In the table, the symbol "+" means positive correlation and the symbol "x" means negative correlation.

Table 6 Correlation Matrix

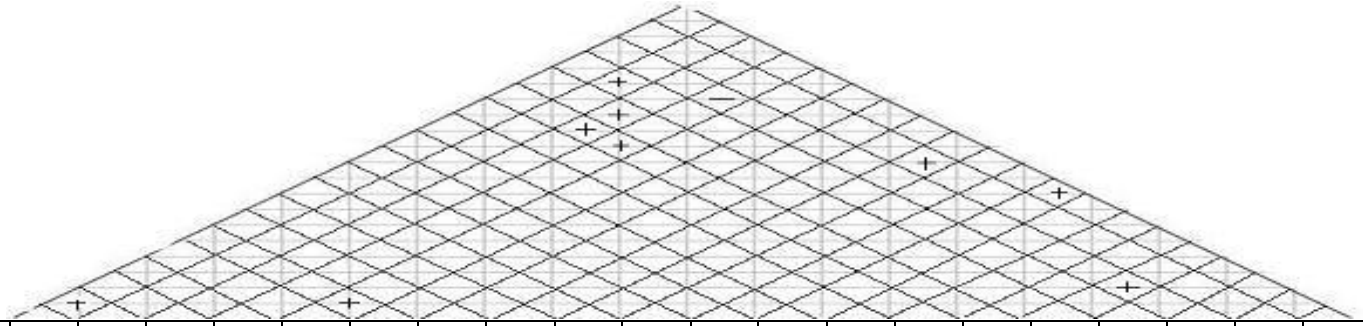


As can be seen from the table above positive correlations between "Following a pricing policy" and "Specialty based benchmarking studies", "Specialty based benchmarking studies" and "R&D activities", "Obtaining missing documents" and "Direct solution upon

damage", "Obtaining missing documents" and "Constant communication upon damage", "Completing damage file info" and "Direct solution upon damage", "Agreements with banks" and "Making installments", "Stating the warranties clearly and explicitly" and "Readable fonts in policy", "Advertisement campaigns in national press" and "Emphasizing corporate identity", "Constant communication upon damage" and "Interactive damage inquires" are found. Also, a negative correlation between "Completing damage file info" and "Interactive damage inquires" is found.

4.7. Planning the Development Project Based on Results

In the final stage, house of quality shown in Table 7 is built with placing customer satisfaction values from the questionnaire of Insurance Company B, the rival of Insurance Company A, into the house.



Customer Desire	**Significance Level**	Following a pricing policy	Specialty based benchmarking studies	Obtaining missing documents	Completing damage file info	Agreements with banks	Making installments	Advantages for in advance payments	Policy's compliance with	Stating the warranties clearly and	Representative visits	Advertisement in local press	Advertisement campaigns in national	Continuous trainings, meetings and	Meticulousness in agency selection	Direct solution upondamage	Constant communication upon damage	R&D activities	Interactive damagei nquires	Readable fonts in policy	Emphasizing corporate identity	Insurance Company A	Insurance Company B	Expected Quality	Progress Rate	Sales Advantage	Absolute Weight	Relative Weight
Reasonable Price	4,22	**Θ**	**Δ**			**Δ**		O										**Δ**				2,84	4,41	4,22	1,48	1,5	9,36	0,17

Payment of the Refund in a Short Time	4			**Θ**	**Θ**											O	O					2,89	4,30	4	1,38	1,5	8,28	0,15
Easy Terms of Payment for Insurance pol.	3,95	**Δ**				**Θ**	**Θ**	O														2,98	4,38	3,95	1,32	1,2	6,25	0,11
Honesty in Insurance pol.	3,66								O	**Θ**										**Θ**	O	3,24	3,89	3,66	1,15	1	4,39	0,08
Popularity (Brand Value)	3,57	**Δ**									O	**Θ**	**Θ**			**Δ**					O	2,84	4,68	3,57	1,25	1,2	5,35	0,10
Attitude of the Agency	3,97										O			**Δ**	**Θ**							3,78	4,10	3,97	1,05	1	4,16	0,07

Company's Attitude After Damage	4,14			O												**O**	**O**		O			3,17	4,60	4,14	1,30	1,2	6,45	0,12
Technological Infrastructure	2,90																	**O**	O			3,13	3,70	3,13	1,01	1	2,92	0,05
Appearance of the Insurance pol.	2,85										**Δ**									**O**	O	3,08	3,76	3,08	1,01	1	8,77	0,15
Absolute Significance																				118,44	55,5							
Relative Significance																				11,5	5,4							

International Journal of Academic Research in Business and Social Sciences
April 2016, Vol. 6, No. 4
ISSN: 2222-6990

5. Analyzing and Interpreting the Results

In an environment where customer needs and requirements are changing constantly and competition conditions are getting harder everyday with the impact of globalization, insurance companies are paying attention to take quality and customer desires into consideration.

When the absolute weight column of the house of quality is examined, it can be seen that "Reasonable Price" is the most significant customer desire. Investigating the quality characteristics that fulfil the customer desire "Reasonable Price", it can be said that "Following a pricing policy", "Specialty based benchmarking studies", “Agreements with banks”, "Advantages for in advance payments" and "R&D activities" are significant characteristics and making improvements on them will result in customer satisfaction providing Insurance Company A a major competitive advantage.

"Appearance of the Insurance Policy" is found to be the following customer desire after "Reasonable Price". Investigating the quality characteristics that fulfil that customer desire, "Representative visits", "Readable fonts in policy" and "Emphasizing corporate identity" are found to be significant. With the help of visits of representatives of Insurance Company A to agencies, customers will have more information about the appearance of the insurance policy.

Evaluating these two mentioned customer desires together, insurance companies should place more importance on the appearance of the insurance policy and lower the prices in order to gain competitive advantage.

These two factors are followed by "Payment of the Refund in a Short Time" and "Attitude of the Company After Damage" in significance order. Insurance Company A stated that it can improve "Payment of the Refund in a Short Time" factor with quality characteristics; "Obtaining missing documents", "Completing damage file info", "Direct solution upon damage" and "Constant communication upon damage". As a result, the company can make an improvement in that customer desire with a systematic and thorough work style upon damage. "Attitude of the Company After Damage" makes "Interactive damage inquires" significant in addition to characteristics mentioned above in significance order.

When another customer desire "Popularity" is examined in terms of quality characteristics, "Following a pricing policy", "Representative visits", "Advertisement in local press", "Advertisement campaigns in national press", “Direct solution upon damage" and "Emphasizing corporate identity" are found to be significant. It can be said that the company is quite behind of its rival in this customer desire (Insurance Company A=2.84, Insurance Company B=4.68). Therefore, advertisement campaigns in both local and national press should be intensified and brand value should be boosted.

It is found that in order to improve the customer desire "Honesty in Insurance Policy", quality characteristics "Policy's compliance with general requirements", "Stating the warranties clearly and explicitly", "Readable fonts in policy" and "Emphasizing corporate identity" should be placed more importance on. It is known that Insurance Company A behaves ethically in competition and serves its customers with transparency as fundamental principles. With house

of quality, it is observed that it does not have much difference from its rival. However, it can create a more trustworthy image for customers if it emphasizes its corporate identity.

Investigating another customer desire "Attitude of the Agency", it is found that improving quality characteristics "Representative visits", "Continuous trainings, meetings and seminars" and "Meticulousness in agency selection process" will provide development. Insurance Company A will improve the customer desire "Attitude of the Agency" by continuously visiting its agencies, organizing meeting at District Offices and providing trainings for its agencies on adopting attitudes towards customers.

Investigating the customer desire "Technological Infrastructure", less important than others, it is found that Insurance Company A's existing conditions are satisfactory.

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