

# 'WALK IN YOUR CUSTOMER'S SHOES'- THE QUALITY FUNCTION DEPLOYMENT (QFD) APPROACH

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*[Customer satisfaction is a growing concern for all organisations. Today quality measurement and the corresponding matrices are decided on the customer's voice. The Voice of Customer/Client (VOC) is a systematic approach of understanding the customer and their needs. Quality Function Deployment (QFD) is a method of translating customer requirements into an appropriate company programme and technical requirements at each phase of the product realisation cycle. It is a systematic way of documenting and breaking down customer needs into manageable and actionable detail. The paper makes an attempt to understand how the customer needs, hierarchies and priorities, can be identified and translated into effective product development leading to customer satisfaction; provide useful insights on Quality Function Deployment (QFD) approach in process-oriented product development activities and touch upon the relevant areas such as Kano model and Affinity diagram to have a better understanding of customer needs.*

**Keywords:** *Quality Function Deployment (QFD), Kano Model, Affinity Diagram, Voice of Customer (VOC)]*

## **Introduction**

Organisations across the globe are trying to be responsive to the needs of the customers to have superior competitive advantage. The entire demand and supply has undergone a sea change in the last two decades with the advent of innovations putting pressure on both customers and producers. Customer satisfaction is a growing concern for all organisations. Since the customer is the sole assessor of the finished product, it is very important that they are heard at every aspect of the quality process in the organisation. Today quality measurement and the corresponding matrices are

decided on the customer's voice. The Voice of Customer/Client (VOC) is a systematic approach of understanding the customer and their needs.

The paper makes an attempt to understand how the customer needs, hierarchies and priorities, can be identified and translated into effective product development leading to customer satisfaction. In discussing the issues involved in fulfilling customer needs the paper tries to provide useful insights on Quality Function Deployment (QFD)

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approach in process-oriented product development activities. The paper also tries to touch upon the relevant areas such as Kano model and Affinity diagram to have a better understanding of customer needs.]

### **QFD - Meaning**

QFD is a method of translating customer requirements into an appropriate company programme and technical requirements at each phase of the product realisation cycle. It is a systematic way of documenting and breaking down customer needs into manageable and actionable detail. It is a planning methodology that organises relevant information to facilitate better decision making and a way of reducing the uncertainty involved in product and process design. It promotes cross-functional teamwork and gets the right people together, early, work efficiently and effectively to meet customer's needs. According to Muralidharan and Syamsundar (2012), QFD is a structured methodology to identify and translate customer needs and wants into technical requirements and measurable feature and characteristics; from marketing and sales to research and development, engineering and manufacturing and distribution and services.

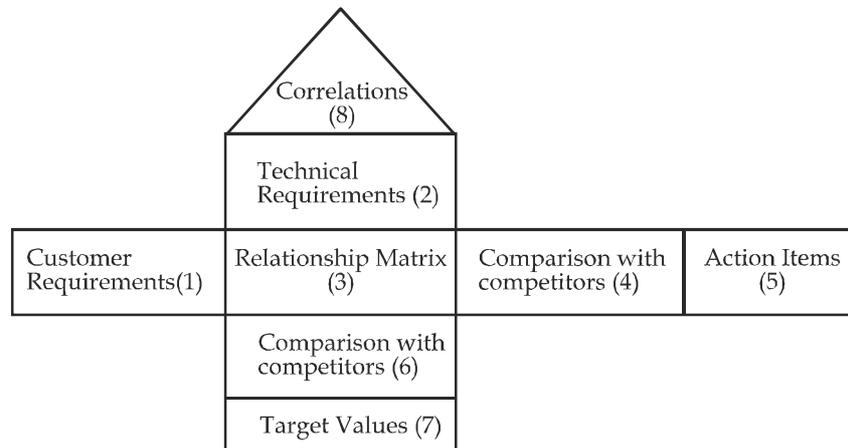
It was Yogi Akao who introduced the concept of 'quality tables' at the Kobe

Shipyards in 1972. This is considered to be the first formalized approach of QFD (Govers, 1996). According to a survey in 1986, it was observed that the usage of QFD had increased significantly among the larger member companies of the Japanese Union of Scientists and Engineers (JUSE) (GOAL/QPC, 1990). The technique was applied with very good results at Toyota and its suppliers. Further, it expanded to other Japanese manufacturers like consumer electronics, home appliances, clothing, integrated circuits and apartment layout planning, etc. The technique was adopted by Ford and GM in the 1980s and other important companies like Hewlett Packard, AT&T and ITT later.

### **House of Quality**

The basic building block of QFD is the house of quality. It is represented in a multidimensional matrix sometimes called *L-matrix* and shows the correlation between 'What is' and 'How is' of the process stages. A full QFD product design project will involve a series of these matrices, translating from customer and competitive needs all the way down to detailed process specifications. It helps to identify the critical quality characteristics. The characteristics critical to quality (CTQ) are nothing but a product feature or process step that must be controlled to guarantee that you deliver what the customer wants.

Figure 1 : QFD matrix

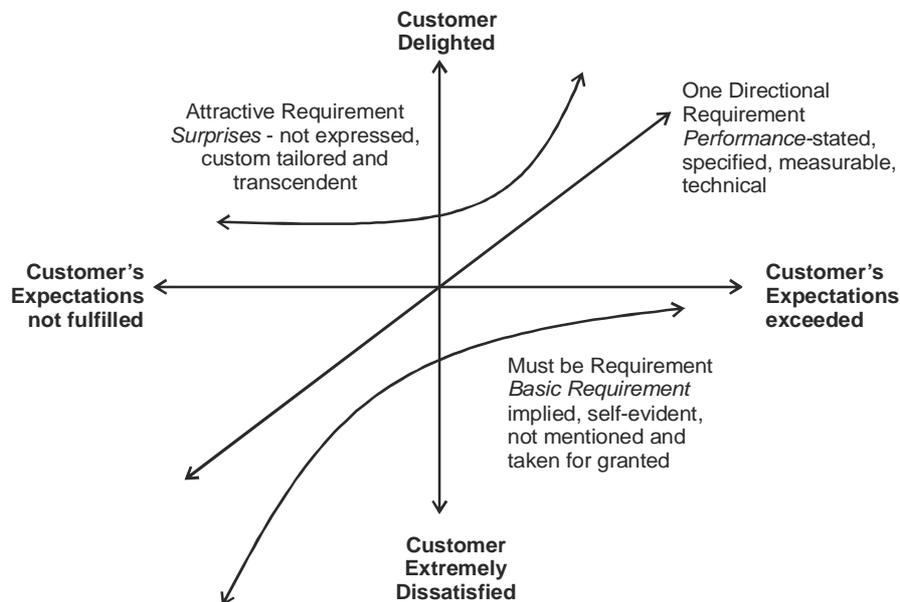


As seen in the figure 1, QFD matrix consists of several parts. The matrix is formed by first filling in the customer requirements (area 1), which are developed from analysis of Voice of Customer/Client (VOC). The technical requirements are established in response to the customer requirements and placed in (area 2). The relationship (area 3) displays the connection between the technical requirements and the customer requirements. The comparison between the competitors and the customer requirement is shown in (area 4) optional and the (area 5) provides an index in documentation concerning improvement activities. (Area 6), like (area 4), is again optional and it plots the comparison with the competitors for the technical requirements. (Area 7) lists the target values for the technical requirements.

(Area 8) shows the co-relationships between the technical requirements. A positive correlation indicates that both technical requirements can be improved at the same time. A negative correlation indicates that improving one of the requirements will worsen the other.

The completed matrix can provide a database for product development, serve as a basis for planning product or processes improvements, and suggest opportunities for new revised product or process introductions. If a matrix has more than 25 customer voice lines, it tends to become unmanageable. In such a situation, a convergent tool such as *Kano model* and *Affinity diagram* may be used to condense the list (Muralidharan and Syamsundar, 2012).

Figure 2 : Kano's Model of Customer Satisfaction



Source: Berger et. al. (1993)

This model of customer satisfaction as depicted in figure 2 identifies several types of requirement that impact customer satisfaction. It separates customer requirements into several categories which are:

- **Must be requirements** or *basic requirements* are those in which the customer assumes will be there. In case it is not there, the customers will be unhappy.
- **One-dimensional requirement** are those in which the customer expects a certain level of sufficiency, and anything exceeding the level increases satisfaction.
- **Attractive requirements** are the way to get to the heart of the customer. When present, they increase satisfaction, but

their absence does not cause dissatisfaction.

In the cases discussed above, the customers can be classified as satisfied, happy and delighted customers. An awareness of these features of customer satisfaction (and dissatisfaction) provides insights and guidance for the organisation's goal of ever-improving customer.

### Affinity Diagram

Affinity Diagram is a tool/method to gather large amounts of intertwined verbal data (ideas, opinions, issues, etc.). It organises the verbal data into groups based on natural relationship. Such formation of distinct groups help develop a meaningful picture, thereby, making

further analysis feasible and finding a solution to the problem. In simple terms Affinity diagram

- is an innovative tool creatively used
- it helps understand and discover problems
- it is based on verbal data/information and hence not quantifiable
- in this an overall idea of a problem situation can be developed and possible solution can be arrived at
- it gives clarity of confused situations
- analysis based on creativity and gut-feeling, rather than on logic, to explore

Preparation of Affinity Diagram is a time-consuming process. It is not used for simple problems. This tool is used in the following situations

**a) When we explore into unknown areas**

When we confront a problem or a problem arises, it is a natural tendency of human being to try to understand through logical reasoning, use past experience, and or to form opinions quickly. Similarly, when one works in a field, one should analyse without any bias the ideas of others. In this process, one can add one's own ideas with that of others and then try to find an affinity to form an opinion.

**b) When we want to adopt and modify the existing system**

An existing system may have a basis. Sometimes it is useful to study and build upon that by having new experiments and bringing some changes. This is called

the Breakthrough approach. Existing system can be broken in terms of pieces of information and then one can build a new system by adding to, rearranging, and forming, a Affinity Diagram.

**c) When one wants to unify thinking of diverse group of people**

When no unity exists in a heterogeneous group of people, teamwork must be promoted for mutual understanding Construction of Affinity Diagram with their participation enables tapping of the views, experiences and ideas of the people on the selected problem and classifying those into orderly groups of similar ideas. This way mutual understanding and team work is promoted by the affinity Diagram.

**d) When one wants thorough communication of new ideas and policies**

In successful implementation of a new idea or policy, the concerned person's participation is crucial. For this, first float the idea or policy among people involved and create an environment wherein people would come out with their ideas without hesitation and prejudice. The bank of ideas so generated needs to be organised into meaningful groups. Use of the Affinity Diagram approach creates a sense of ownership amongst the participating personnel and, thus, ensures easier and effective implementation.

**e) When facts or thoughts are not clear**

When an issue is too large or complex to understand, making an Affinity Diagram helps for better understanding. (Ganapathy et.al 2004)

### Benefits of QFD

According to (Govers, 1996) companies using QFD had decreased start up problems, better competitive analysis through improved market research and

clarity in control points reducing development time. Moreover it led to effective communication between divisions (departments) and design intent which got carried through to manufacturing.

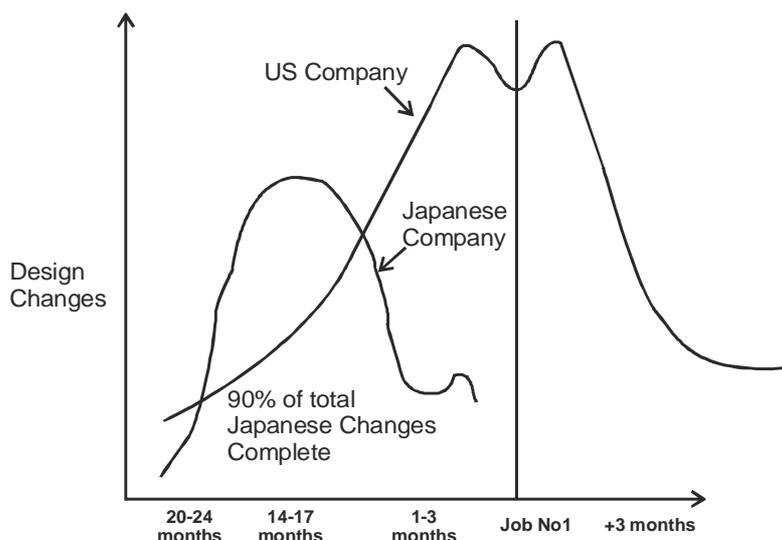


Figure 3: Japanese auto maker with QFD versus US maker without QFD

Source: Sullivan (1986)

In figure 3 the benefit of QFD has been shown. It compares the number of design changes at a Japanese auto manufacturing company with QFD against a US auto manufacturing company without QFD. It is quite evident that QFD leads to fewer changes in product development projects. This in turn reduces start up costs.

### Conclusion

Often the success of Japanese companies is attributed to the Japanese culture. It was felt that the cultural differences played an

integral part in crafting the meteoric rise of Japanese companies. However one must not forget that not all Japanese companies are equally successful. The achievements of the best performing companies have been through structures, routines, culture and certain philosophies. The more important issue is that many of the Japanese companies have been successful with production plants in foreign lands. It would be extremely unwise to attribute the success of Japanese companies in terms of quality building for culture alone. The quality philosophies

have an equally important role in its product development process. Although QFD has originated in Japan yet, it has become equally popular in the west. The most important contribution of QFD has been through understanding customer requirements clearly, correctly handling the data on competitors and understanding the interdependence of technologies. Finally the QFD philosophy not only bridges the gap between the customer wants and what the company can afford to build, it replaces decision making based on intuition with a structured methodology and lays down a basis of organisational learning.

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