

The Analysis of Customers Needs in Relationship with the QFD

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Abstract. In this paper we proposed to analyse the customers needs in relationship with the QFD (Quality Function Deployment). QFD provides a standardized method of representing customer needs. This method is by no means a method of learning what de customer needs are (acquiring the Voice of the Customer), but it does provide a way of systematically representing of those needs.

Keywords – customer needs, QFD, VoC.

I. INTRODUCTION

QFD was developed to design quality into a product [1]. QFD utilizes basic dimensionality within a project to provide a structured way of designing quality into a system. It addresses dimensions including customer need, quality characteristics, functions, parts, and failure modes.

A customer need is the quality demanded by the customer. A quality characteristic is a measurable attribute by which one can measure whether a customer is getting the demanded quality. The "voice of the customer" is a process used to capture the requirements/feedback from the customer (internal or external) to provide the customers with the best in class service/product quality. This process is all about being proactive and constantly innovative to capture the changing requirements of the customers with time.

The "voice of the customer" is the term used to describe the stated and unstated needs or requirements of the customer. The voice of the customer can be captured in a variety of ways: Direct discussion or interviews, surveys, focus groups, customer specifications, observation, warranty data, field reports, complaint logs, etc.

This data is used to identify the quality attributes needed for a supplied component or material to incorporate in the process or product. Further, QFD allows customers to prioritize their needs, benchmark us against our competitors, and then direct us to optimize those aspects of our product and organization that will bring the greatest competitive advantage.

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II. TYPES OF NEEDS

To satisfy customers, we must understand how meeting their needs effects satisfaction. There are three types of customer needs to consider (see Figure 1) (Kano, et al 1984).

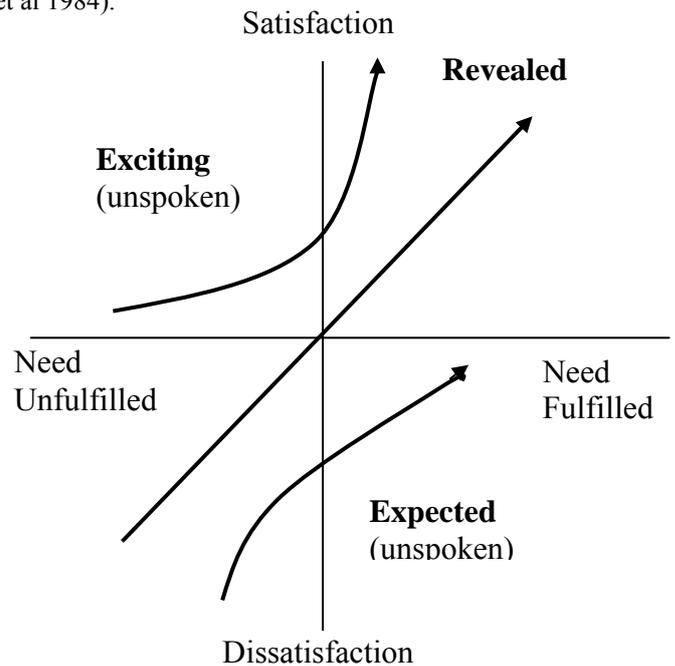


Fig. 1. Kano Model (adapted). Products and services must meet all three types of requirements - not just what the customer says.

Revealed Needs are typically what we get by just asking customers what they want. These needs satisfy (or dissatisfy) in proportion to their presence (or absence) in the product or service. Fast delivery would be a good example. The faster (or slower) the delivery, the more they like (or dislike) it.

Expected Needs are often so basic the customer may fail to mention them - until we fail to perform them. They are basic expectations without which the product or service may cease to be of value; their absence is very dissatisfying. Further, meeting these needs often goes unnoticed by most customers. Expected needs must be fulfilled.

Exciting Needs are difficult to discover. They are beyond the customer's expectations. Their absence doesn't dissatisfy; their presence excites. These are the things that wow the customers and bring them back. Since customers

are not apt to voice these needs, it is the responsibility of the organization to explore customer problems and opportunities to uncover such unspoken items.

Kano's model is also dynamic in that what excites us today is expected tomorrow. That is, once introduced, the exciting feature will soon be imitated by the competition and customers will come to expect it from everybody. Kano found that the exciting needs, which are most tied to adding value, are unspoken and thus invisible to both the customer and the producer. Further, they change over time, technology, market segment, etc. The Voice of Customer analysis tools and techniques were created to break through this dilemma.

A. What information does the customer supply for the product design process?

The information supplied by the customer have to be transposed in the product design specifications. There is a great variety of requirements from the part of the customers with respect to the new product, but they need to be grouped according to various techniques and criteria. The major problem is the quality of the information which should have a great impact as far as the success of the product is concerned. Figure 2 presents the main categories of needs from the part of the customers transposed in design specifications.

The functional needs refer to what is expected from the product, which is its global function and its service

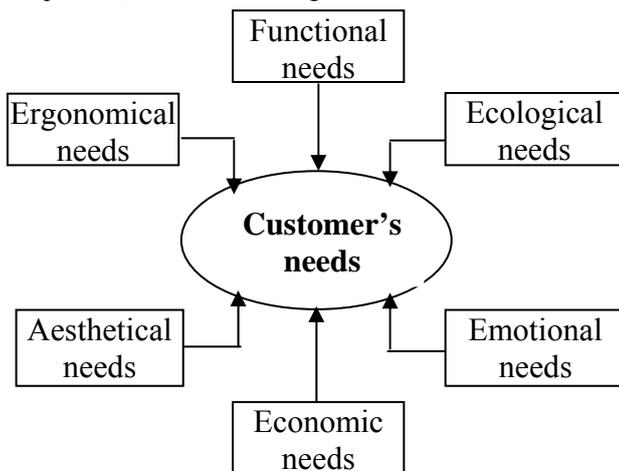


Fig. 2. Types of needs

functions that have to be carried out by it. Functional needs refer to the product individual performances, its reliability during a longer period of operation, its durability and servicing all during the product operation, etc.

The ecological needs refer to the product manufacture, use and integration within the natural environment, as well as its recycling when no longer used. Customers may have opinions concerning the manufacturing process and the materials used for the product manufacture with a view not to affect the environment. The customers would not buy a product with a negative impact over the

environment. They may wish to use a product with low consumption of energy and an easy to be recycled product. Besides the customer's needs with reference to the environment, the international norms for the environment protection shall be observed.

The ergonomical needs refer to the characteristics of the product which bring about additional comfort in usage.

The aesthetical needs refer to the impact of the product over the customers senses (subjectively expressed), the most remarkable being the visual effect correlated with the product market image. These needs generally aim at the form, color, surfaces texture and the overall dimensions of the product.

The category of emotional needs is considered the most difficult category to be defined and evaluated, because it refers to the product impact over the customer's emotional side. For example, various characteristics of the product may create the feeling of luxury, wealth, safety, etc. to the customer. An important aspect of the emotional needs is the fact that they are difficult to be measured and almost impossible to be predicted.

The economic needs are those which impose the quality of the product at the minimum cost.

B. Gather Customer Needs

The steps for gather customer needs are:

1. Plan collection of customer needs. What sources of information will be used? Consider customer requirement documents, requests for proposals, requests for quotations, contracts, customer specification documents, customer meetings/interviews, focus groups/clinics, user groups, surveys, observation, suggestions, and feedback from the field. Consider both current customers as well as potential customers. Pay particular attention to lead customers as they are a better indicator of future needs. Plan who will perform the data collection activities and when these activities can take place. Schedule activities such as meetings, focus groups, surveys, etc.
2. Prepare for collection of customer needs. Identify required information. Prepare agendas, list of questions, survey forms, focus group/user meeting presentations.
3. Determine customer needs or requirements using the mechanisms described in step 1. Document these needs. Consider recording any meetings. During customer meetings or focus groups, ask "why" to understand needs and determine root needs. Consider spoken needs and unspoken needs. Extract statements of needs from documents. Summarize surveys and other data. Use techniques such as ranking, rating, paired comparisons, or conjoint analysis to determine importance of customer needs. Gather customer needs from other sources such as customer requirement documents, requests for proposals, requests for quotations, contracts, customer

specification documents, customer meetings/interviews, focus groups, product clinics, surveys, observation, suggestions, and feedback from the field.

4. Use affinity diagrams to organize customer needs. Consolidate similar needs and restate. Organize needs into categories. Breakdown general customer needs into more specific needs by probing what is needed. Maintain dictionary of original meanings to avoid misinterpretation. Use function analysis to identify key unspoken, but expected needs.
5. Once needs are summarized, consider whether to get further customer feedback on priorities. Undertake meetings, surveys, focus groups, etc. to get customer priorities. State customer priorities using a 1 to 5 rating. Use ranking techniques and paired comparisons to develop priorities.

C. Gather the Voice of the Customer

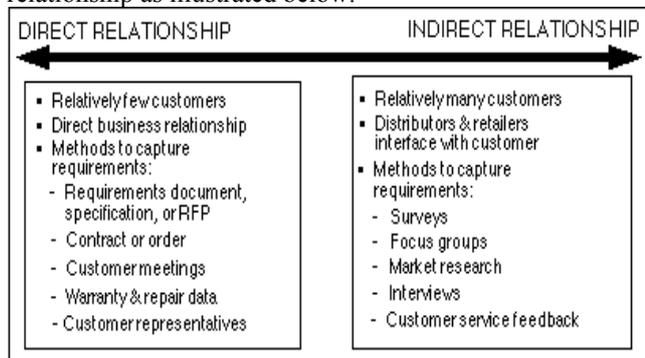
The usual steps in creating the Customer Needs Section are:

1. Gather the Voice of the Customer
 - Interview customers;
 - Gather customer complaints.
2. Sort the Voice of the Customer into major categories, including:
 - Needs/benefits;
 - Substitute quality characteristics;
 - Reliability requirements.
3. Structure the Needs in an affinity diagram.

D. Capturing the Voice of the Customer

Once a product plan is established which defines the target market and customers, the next step is to plan how to capture these customer's needs for each development project. This includes determining how to identify target customers, which customers to contact in order to capture their needs, what mechanisms to use to collect their needs, and a schedule and estimate of resources to capture the voice of the customer (project plan for product definition phase).

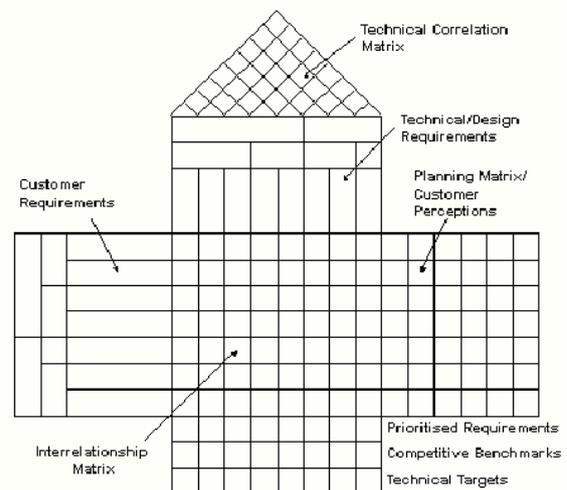
As opportunities are identified, appropriate techniques are used to capture the voice of the customer. The techniques used will depend on the nature of the customer relationship as illustrated below.



There is no one monolithic voice of the customer. Customer voices are diverse. In consumer markets, there are a variety of different needs. Even within one buying unit, there are multiple customer voices (e.g., children versus parents). This applies to industrial and government markets as well. There are even multiple customer voices within a single organization: the voice of the procuring organization, the voice of the user, and the voice of the supporting or maintenance organization. These diverse voices must be considered, reconciled and balanced to develop a truly successful product.

III. QUALITY FUNCTION DEPLOYMENT

After establish the KANO rankings of the proposed functional and nonfunctional requirements, use the House of Quality from Quality Function Deployment (QFD) to further prioritize the requirements. The House of Quality will help you stay focused on the customer's priorities.



Quality Function Deployment or "QFD" is a flexible and comprehensive group decision making technique used in product or service development, brand marketing, and product management. QFD can strongly help an organization focus on the critical characteristics of a new or existing product or service from the separate viewpoints of the customer market segments, company, or technology-development needs. The results of the technique yield transparent and visible graphs and matrices that can be reused for future product/service developments. [4]

In QFD to see our customer's problems and opportunities as they happen. Unlike other customer information gathering techniques, such as focus groups, we do not ask questions about our problems with technology or marketing, we are not removed to an artificial site such as a meeting room and we are not relying on customers' memories to report problems to us. Rather, we can employ all of our senses to work for us by using contextual inquiry, video taping, audio taping, direct observation, direct interviewing with customer's

employees, etc. for the larger purpose of trying to understand how we can help our customers better conduct their business with their customers.

Quality Function Deployment requires that the basic customer needs are identified. Frequently, customers will try to express their needs in terms of "how" the need can be satisfied and not in terms of "what" the need is. This limits consideration of development alternatives. Development and marketing personnel should ask "why" until they truly understand what the root need is. Breakdown general requirements into more specific requirements by probing what is needed.

QFD uses a series of matrices to document information collected and developed and represent the team's plan for a product. The QFD methodology is based on a systems engineering approach consisting of the following general steps:

1. Derive top-level product requirements or technical characteristics from customer needs (Product Planning Matrix).
2. Develop product concepts to satisfy these requirements.
3. Evaluate product concepts to select most optimum (Concept Selection Matrix).
4. Partition system concept or architecture into subsystems or assemblies and flow-down higher-level requirements or technical characteristics to these subsystems or assemblies.
5. Derive lower-level product requirements (assembly or part characteristics) and specifications from subsystem/assembly requirements (Assembly/Part Deployment Matrix).
6. For critical assemblies or parts, flow-down lower-level product requirements (assembly or part characteristics) to process planning.
7. Determine manufacturing process steps to meet these assembly or part characteristics.
8. Based in these process steps, determine set-up requirements, process controls and quality controls to assure achievement of these critical assembly or part characteristics.

IV. CONCLUSION

Understanding the true needs of customers requires work on the part of designers and planners. It has never been an easy task, just ask anyone who has designed a product for what the customer thought he wanted, only to find out that the product was still not acceptable. Analyzing the voice of the customer has come to be a tried and true way of getting a complete and accurate set of both the spoken and unspoken requirements of the customer, for later deployment with QFD into an assured design and delivery of the product, service, software, and even business processes.

Quality Function Deployment is an extremely useful methodology to facilitate communication, planning, and decision-making within a product development team.

In the figure 4 we presented the House of Quality for the mirror

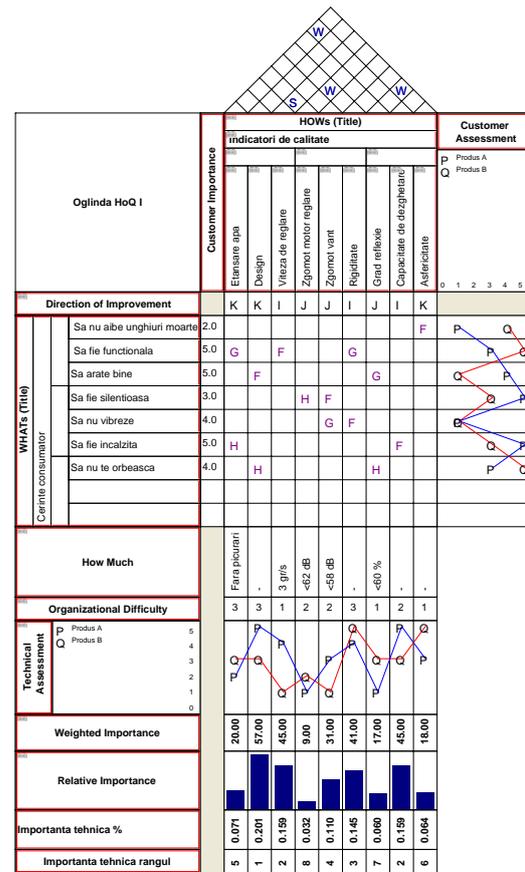


Fig. 4. the House of Quality for the mirror

REFERENCES

- [1] B. King Better (1989), Designs in Half the Time: Implementing QFD Quality Function Deployment in America, GOAL/QPC, Methuen MA.
- [2] D. C. Gause and G. M. Weinberg (1989), Exploring Requirements: Quality Before Design, Dorset House Publishing, New York NY,.
- [3] Daetz, Douglas, William Barnard, Richard Norman. (1995). Customer Integration: The Quality Function Deployment (QFD) Leader's Guide for Decision Making. New York: John Wiley & Sons, Inc.
- [4] http://en.wikipedia.org/wiki/Quality_function_deployment