

# Intelligence Based Customer Requirements Selector Model for QFD

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**Quality Function Deployment (QFD) is a powerful tool in incorporating customer requirements into product specifications. This paper illustrates an intelligence module based software framework for capturing customer voice and publishing in the planning House of Quality matrix of an automated QFD framework. This software can be wrapped up with any Management Information System customized or non-customized for a particular company. This module is based on a concept called Global Remote Quality Function Deployment Object which is the parent frame work for the module discussed in this paper.**

**Keywords— GRQFDO, QFD, Current Customer Requirements, Intelligence Module, Requirement Forward engine, SBIM**

## I. INTRODUCTION

When designing a new product or enhancing an existing product line, designers and engineers are regularly confronted with a series of high impact decisions regarding alternative design concepts, prioritizing often competing customer requirements, establishing performance targets, and adopting processes to systematically deliver quality products to the end users [2].

The decisions that are made should be so accurate to reflect the customer voice that the designers and engineers need a clear idea of the customer needs and a quick decision from the top management is needed to proceed with the idea that will eventually reach the customer end [1].

It is obvious that there should be a smooth, effective and queue free communication enabled to achieve this. Among these important communications, concentration is focused on the three important ones which are between.

- 1).The design engineers (DE) and current customer requirements (CCR).
- 2).The design engineers and the decision makers (DM) of the company.
- 3).The top management or decision makers with the current customer requirements, after deployment.

This paper discusses a framework or module that deals with the effective first communication that is the communication between DE and CCR. The module is integrated into a Quality Function Deployment framework called Global Remote Quality Function Deployment Object (GRQFDO) which is proposed QFD system which can be accessed by any company for overall improvement of the

product or creation of a new product with respect to the market response without any lag [3].

## II. THE INNOVATIVE QFD OBJECT

A GRQFDO is an innovative framework which starts from market response to the incorporation (or non-incorporation) of these responses in a product based on each and every minute property analysis by encapsulating total involvement of each and every department of a company.

The architecture of a GRQFDO is shown in figure 1.

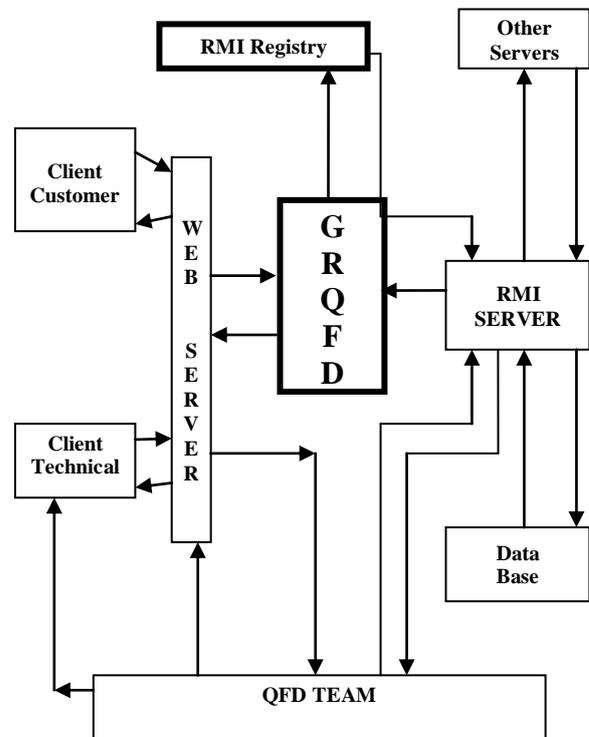


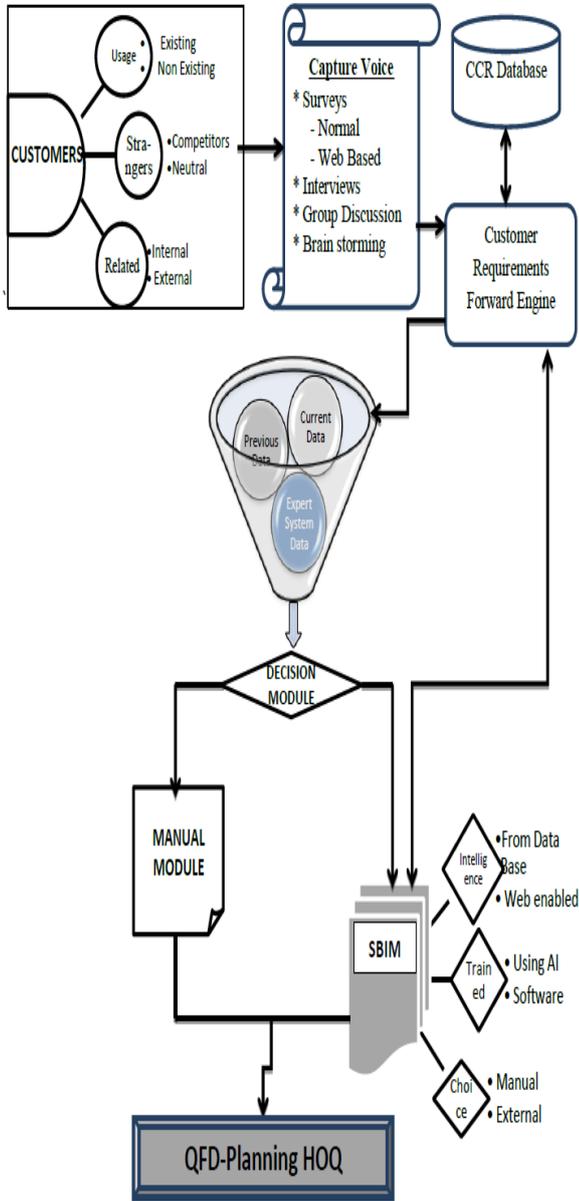
Fig 1. GRQFDO Framework

This framework is a simple one in which a client customer represents any data that is supplied based on customer response [3]. The client technical represents internal or external node responsible for input of technical data.

This GRQFDO is incorporated with the proposed module in customer side and the data from the proposed module is fetched by the planning House of Quality (HOQ).

III. THE CURRENT CUSTOMER REQUIREMENTS MODEL

Figure 2 shows the conceptual framework of CCR model.



SBIM – Software based Intelligence Module CCR – Current Customer Requirements

HOQ- House of Quality

Figure 2 CCR based model for GRQFDO

The current customer requirement (CCR) model is a unified model for any software language that can create a customer input model based on Intelligence either artificial or trained.

This model should be created based on the data collected from the existing customers mostly by using online surveys. If on line surveys are not feasible then manual surveys could be conducted and the data should be sequentially arranged as per the CCR model architecture.

Various blocks building the framework is explained in the sections with expected functions.

A. Customers

The customers are classified as per different criteria the first and the important one being the usage, the second one being non existing or strangers to the product and the last one called relative which represents those who are having some technical idea of the product.

The first classifications of customers are the ones whose voices are stronger than any other customers that are identified. Their views or demands show the merit and demerit of the current product. The voice of these customers can be captured in traditional way but as per the GRQFDO concept if this process has to be done on line by web based surveys or by using market survey company data base.

The voices of second group of customers are difficult to capture as they are total strangers to the home product but if penetrated properly these voices reflects the competitors in the market. A clear comparison of company’s existing product with its competitors is the aim in selecting this group of customers.

The third group of customers includes internal and external where internal comprises of all employees working in the company who have some knowledge about the product and external comprises of dealers, suppliers, salesman etc. These data are directly deposited in the CCR database.

The data can be single keyword or needs of customers identified in sentences. The data while it is stored is checked for duplication and the frequency of a single data is generated. This process starts in the customer requirements forward engine.

B. Customer Requirements Forward Engine (CRFE)

In the GRQFDO this engine is created using Java software. The main functions of this engine includes

- Analyzing the customer voice input
- Tagging the relevant voice
- Checking each voice feasibility
- Generating frequency of each voice tagged
- Intelligent forwarding of customer voice

The first two functions that is analyzing and tagging are quite easy since java language is used for coding. Checking the feasibility of the customer input is a dynamic procedure which can be extended to any level. It can be done in simple way by sending the query to a QFD team member or a member of the design team.

Design team member can verify the feasibility with help of GRQFDO for example it can use internet based material selector for material selection for the demand or similar technical data can be accessed with ease and return the

decision in stipulated time. The last function of CRFE is to forward the customer demands along with any existing data available or with expert system data available within the network.

All these data gets converged and loaded in data base and is supplied to the decision making module which has manual as well as software based option. Each and every demand passes through each of these modules and the data finally reaches the first phase of QFD which is the planning phase.

### C. Software Based Intelligence Module (SBIM)

Software based Intelligence module is artificial intelligence (AI) system created using java software making using of various data incorporated based on all dimensions of the product. This software uses traditional AI system architecture but provided high flexibility and can be customized for the needs of individual companies who are in conjunction with the GRQFDO.

The intelligence is generated based on data base and also from web pages that contains key information about the product. The advantage of web based intelligence is that this data mostly will be the most updated one. This sort of extraction of intelligence is only because of inter-language communication possible between the different web sites [7]. For example in today's web world a web page created in ASP can easily communicate with a web page created in JSP. An example of such frame work in the .net and there are similar frameworks available in the web world which allows high inter web page communication

Trained data means the demand data which are already analyzed minimum three times can directly inserted in HOQ without much effort as all the data related to it can be chosen in just one click.

Design engineers are forwarded with complicated, unrecognized demand data with all the related technical data available with the software. The designers are provided with a pull down menu providing all the related data and each data can be analyzed with the help of internal and external man power.

The finalized demand is directly inserted along with its technical description into the planning HOQ. The HOQ is made available to all the members of QFD team, concerned managers and top level decision makers. The voice of customers in their order of preference and the first level feasibility of incorporating it in the product is projected which is the first level aim of GRQFDO. This helps the designers and managers of all levels to be aware of need of product improvement as and when it is generated in the market. This also helps the quality team of the company to analyze the quality level of the product with respect to competitors' product.

## IV. CONCLUSIONS

The need for reflexive improvement in product based on customers demand is a challenge to any designers. This challenge can be face with help of Global Remote Quality Function Deployment Object which is a software based,

Fuzzy incorporated distributed computing based and web enabled Quality Function Deployment software. This paper discuss about the Current Customer Requirements based GRQFDO module which allows the designers, managers and top level decision makers to be updated about the market needs and the exact time at which decision is to be made to initiate a product enhancement. This module is a key module which can be incorporated to any Management Information System environment and also it could be made an integral part of the Decision Support System.

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