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Generative Type Quality Function Deployment Object

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Abstract— **every product in the market is exposed to high competitive environment and to sustain in this scenario product development / Improvement based on the taste of customer is a must. Quality Function deployment serves the above purpose but it also has to change with changing technologies, cross section of customers and manufacturers.A remote QFD object which allows the complete automation of the Deployment process is discussed in this paper. The object encapsulates the basic deployment calculations based on the data fed into it logically.**

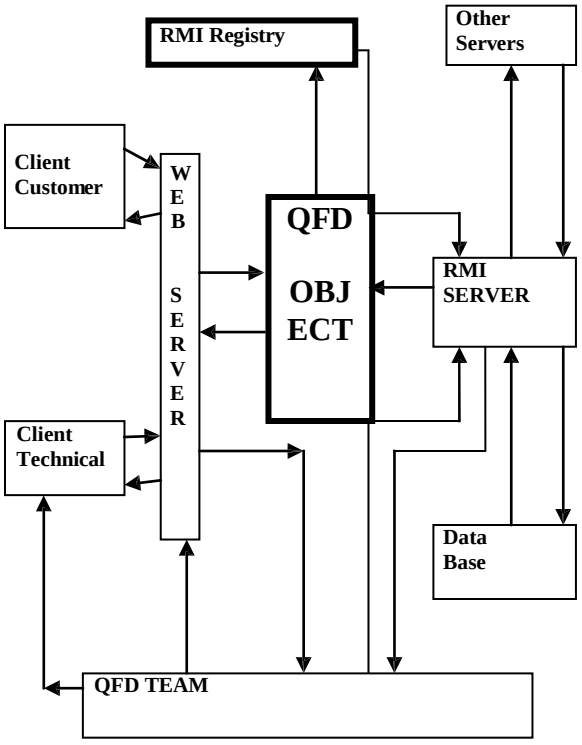
Keywords— **Automated QFD, selective deployment, modified HOQ.**

I. INTRODUCTION

Quality must be designed into the product, not inspected into it. Quality can be defined as meeting customer needs and providing superior value. This focus on satisfying the customer's needs places an emphasis on techniques such as Quality Function Deployment to help understand those needs and plan a product to provide superior value.QFD is oriented toward involving a team of people representing the various functional departments that have involvement in product development: Marketing, Design Engineering, Quality Assurance, Manufacturing/ Manufacturing Engineering, Test Engineering, Finance, Product Support, etc [1]. The active involvement of these departments can lead to balanced consideration of the requirements or "what's" at each stage of this translation process and provide a mechanism to communicate hidden knowledge - knowledge that is known by one individual or department but may not otherwise be communicated through the organization. The structure of this methodology helps development personnel understand essential requirements, internal capabilities, and constraints and design the product so that everything is in place to achieve the desired outcome - a satisfied customer. Quality Function Deployment helps development personnel maintain a correct focus on true requirements and minimizes misinterpreting customer needs. As a result, QFD is an effective communications and a quality planning tool.

QFD requires a team of experts from each distinct department. This team has to collect large volume of data and arrange it logically so that it can be properly used in House of Quality (HOQ) matrices. This large volume of data is to be properly placed in a data base from where it can be retrieved as and when required. In this paper a schematic model for handling data for different phases of QFD is generated and its equivalent program in java written to insert it directly to the database logically.This automated QFD object is validated for a sesame oil producer company and the deployed results are compared with traditional QFD results.

2. AUTOMATED QFD



The automated QFD make use of the distributed computing package called Remote Method Invocation. QFD team has direct access to the technical side client services and also to the RMI server. Any alteration in the QFD process can be done by the QFD team directly from their software.

Client technical refers to the technical descriptors that can input their data directly to the software corresponding to the each and every requirements inserted by the customers. An automatic alert function is also activated in this side of the RMI software to intimate the technical side that a required number of inputs from the customer side have been registered. RMI Server encapsulates all the necessary server side programs needed for QFD. It has remote objects for various tasks like inserting customer data into the database, sorting the data, sending these data to other serves for evaluation, prioritizing the customer requirements, prioritizing the technical descriptors, evaluating the absolute weights for customer as well as technical side.RMI registry binds the various remote objects with the server and the look up service helps the client and server requests to be verified in the RMI registry.

3. VALIDATION AND RESULTS

A company which produces Sesame oil from raw sesame seed is selected for validation. Entire production process and various parameters and variables where given to the QFD object to be stored in the data base according to its proximity to be related to each other. An online survey as well as manual survey was conducted. The survey results can be prioritized with ease using the QFD object logic. For the deployment four primary properties such as physical, cooking, body use and handling were fixed as per the expert decision. Physical primary had three secondary properties like colour, smell and touch and feel. Similarly all the primaries were given its secondary properties. A very interesting feature of the QFD object is that once these data are fed to the object it is registered with the RMI server and for subsequent deployment related to the same product using same properties can be selected from a choice box provided. All related data with respect to the selected property will be logically placed by the object which reduces human effort and time. Deployment was carried out for three interrelated phases first by traditional QFD method and then with the help of proposed QFD object.

3.1. COMPARISON-TRADITIONAL QFD VS PROPOSED QFD OBJECT

Three HOQ matrices representing three layers were used for deployment. The weight per importance and relative importance of the deployed matrices are shown in plots given in figures given below.

Figure 1 and 2 shows that the difference between weight per importance of traditional QFD process and that of proposed QFD process. It is visible from the plots that unlike the traditional system the gap between first two properties i.e. colour and health is much lower in proposed system because of the speed and accuracy with which the data is accessed and logically provided. The weights related to health aspects where generated based on data previously loaded after collection from experts of that field in proposed system.

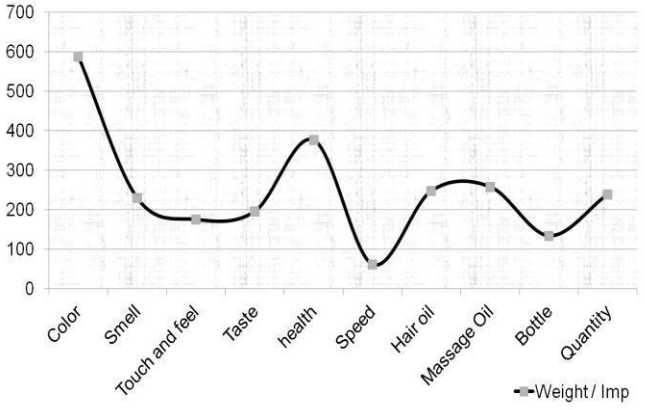


Figure 1 Traditional Weight/Importance of HOQ 1

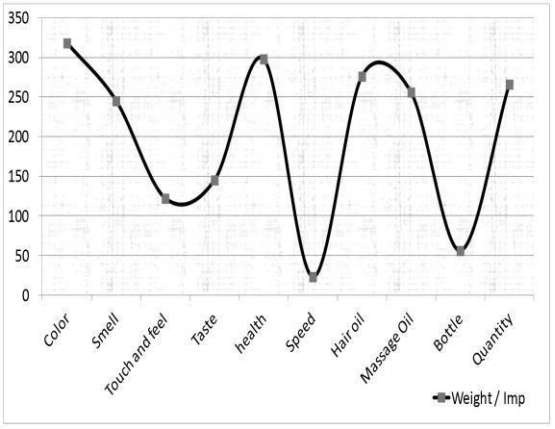


Figure 2 Proposed Object Weight/Importance of HOQ 1

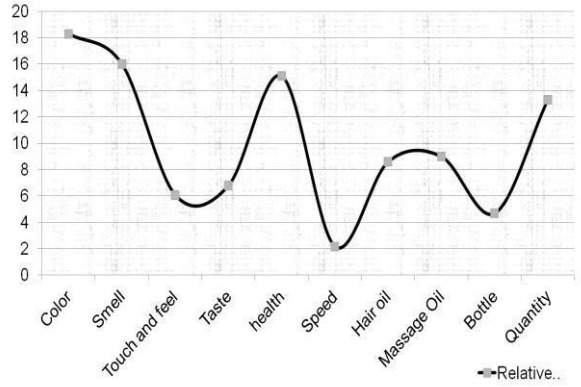


Figure 3 Relative Weight of HOQ 1

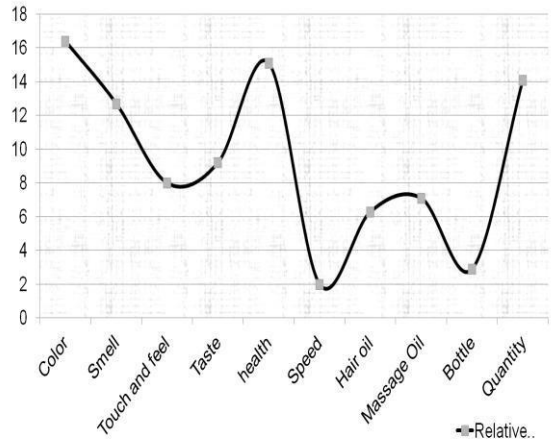


Figure 4 Proposed object Relative weight of HOQ 1

The same trend is seen in relative weights of HOQ 1 as shown in Figure 3 and 4.Data from HOQ 2 and HOQ 3 plotted also showed the same trend in the results.

4. CONCLUSION

A comparative study of traditional QFD process with generative type QFD process is done. Generative QFD outclassed the traditional one in speed, accuracy, relative importance between properties under deployment, user friendly environment and above all the data handling mechanism used. Though an all-function incorporated generative QFD is far from reality, the product planning phase illustrated in this paper alone is sufficient to demonstrate the potential of automated QFD process.

5. ACKNOWLEDGMENT

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