Developing an effective internal customer attribute with in Manufacturing by applying Quality Function Deployment (QFD)

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ABSTRACT:

This paper represents a model that utilizes quality function deployment (QFD) for identification, estimation and determination of internal customer's requirements or to understand what customers mean by efficient quality service and how to achieve it from an engineering perspective within the Manufacturing system. To achieve this objective it emphasizes thoroughly understanding what is the actual requirement of internal customer in perspective of Job accomplish. Within this process internal customer wants are translated into characteristics of the product or service. Finally, those characteristics are translated into details about the processes within the organization that will generate the product or service.

Keywords: Quality Function Deployment (QFD); Internal Customer.

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INTRODUCTION:

Customers are the most important asset of any organization. Customer satisfaction (*Catherine McGuinn, 2009)* must be the primary goal of any organization (Victoria Bellou et al, 2008). A customer is a part of business not an outsider, known to be a life blood of a business. All the business actions are maintained perception of fulfill customer requirements (Andreas C. Soteriou et al, 2000). Essentially customers are categorized as external customer and internal customer (*Steve Farner et al, 2001)*. External customers are those who persuade to manufacture products; is one who purchases the product and influences the sale of product. While on other hand customers inside the company or every person in the process are the internal customers. Internal customers include current employees, distributors, vendors or departments. In any business organization, every person is considered to be a customer and supplier to one another within the internal departments. An internal customer is essentially any employee of the organization providing commodities or services. Customer satisfaction is the central point of every business activity, all these include the significance of identification and measurement of customer needs (M.R.Osman et al,2004), enhancement of employee dexterity, contribution of employees in production or services, creation of supplier joint venture with manufacturer, use of functional teams to identify and solve quality problems, and recreation of improvement in customer satisfaction (M.R.Osman et al,2004). An elevated stage of external customer satisfaction mainly depends upon the level of internal customer

satisfaction and corresponding nature of service quality delivered by internal customers to the external customer in industrial processes. If the business employees cannot functions at their optimum efficiency, the level of services is affected and the end purchaser is impacted which leads to suffer the organizational profit.

Assigning enhanced customer value and satisfaction are significant to a firm's competitive benefits which drive in continuous enhancement on measuring organizational performance from the customer's insight. The success of a business enterprise is directed by the strategic orientation of the organization in the direction of its customers, competitors and internal customers (employees) and the association between these significant components (*Alan Stretton, 2013)*. A superior internal customer relationship management program makes the employees creating synergies, improving external customer services, and promoting organisational process. Employee feels about their job hold close for the enterprise and experience organisational culture, organizational structure, business processes, and information systems with external customer touch points in reference to performance effects on transformation in deliverance of performance in business organization. Organization is accountable to emphasis in the process of realizing significance to identify the relative degree in which the staff member of organisation take care of each other departments' requirement.

INTERNAL CUSTOMER SATISFACTION VIA QFD METHOD:

In order to build a prominent organization, customers' requirements (CR_s) (Liang-Hsuan Chen et al , 2003) have to be attained and considered from the perspective of designer's requirements (DR_s) (Dae-Kee Min, 2008)(Liang-Hsuan Chen et al, 2009). Customers only express '*what*' they want and designers need to figure out '*how'* these *what's* can be fulfilled by a product or services (A.I.A. Costa et al, 2001). Quality function deployment (QFD) is a quality tool for translating the ''voice of the customer'' (Jose Antonio Carnevalli, 2010) (called customer requirements; CRs) (Same Yousefie et al, 2011) into the requirements of the engineers (called design requirements; DRs). DRs are subsequently interpreted into technical-oriented requirements (*how's*) (Lian- Yin Zhai et al, 2009) for design process planning, and detailed production requirements. QFD has been utilizing as a quality tool by many business because of the following three essential reasons (Kasim M. daws et al, 2009): (1) To save design time and development time (2) To focus on the satisfaction of customer (3) To improve communication at all levels of the organization. The initial step in a QFD assignment is the analysis of voice of the customer through gathering the needs of customer to develop products (G.Z. Jia et al, 2011) with higher quality to meet or improve on customers' needs (Adila Md Hashim, 2012). This process involves constructing sets of interlinked matrixes, known as 'quality matrix' and combination of these matrixes is known as "House of Quality" (HOQ)(Mehtap Dursun et al, 2013).In House of quality Customer information and requirement is shown horizontally and Technical information and engineering requirement is shown vertically. The basic process underlying QFD exists in the core of the matrix where the customer requirement ("What") (Herbert Moskowitz et al, 1996) and technical parts and Engineering requirement ("How") intersect, providing an opportunity to examine each customer's voice versus each technical requirement, for a detailed description of QFD formation process.

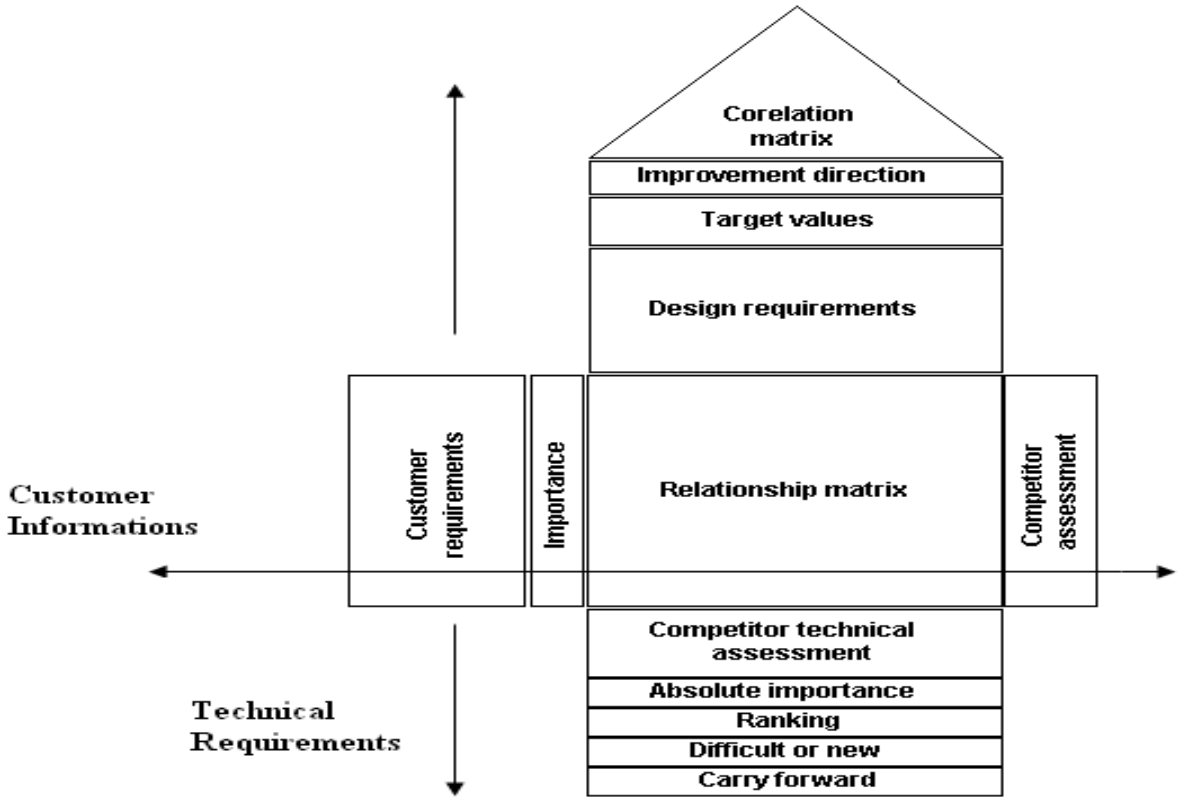

Figure 1. 'QFD' House of Quality (Customer information & technical requirement matrix)

LITERATURE REVIEW:

Alan Stretton (2013): IN this paper author discussed general aspects of identifying customer needs in organization and find out the strategic plans for the requirement of the customer also traits of effective need analysts. These processes were seen as a partnership between the needs analyst and the client organization, involving the following steps:

Step 1: Understand the total context of the client organization's situation.
Step 2: Help the client organization identify its business needs.
Step 3: Identify and reconcile needs of internal customers.

M.R.Osman et al(2004): IN this paper author investigates on the actions that have been practiced by the management of ISO 9001 certified manufacturing companies in fulfilling their internal customer satisfaction to achieve this objective, organizations must focus their efforts on attract and retain external customer benefaction.

Victoria Bellou (2008): IN this paper author discussed and empirically tested the nature of the relationship among service quality, role-prescribed customer service and cooperation among co-workers in the banking sector, both in private and public banks.

Dae-Kee Min (2008): IN this paper author presented for selecting design requirements (DRs) that consider longitudinal effect and acknowledged advantages of QFD. Along with its ability

to promote organizational consensus building and decision making. This proposed model yields not only an optimal set of DRs But also the timing of their selection.

A.I.A. Costa et al (2001): This paper presents a detailed literature review on the topic of the application of quality function deployment (QFD) in the food industry. This review is extended with a thorough description of the methodologies involved in the practice of QFD within food companies, exemplified with the help of a case study on ketchup quality improvement.

G.Z. Jia et al (2011): This paper proposes an approach for manufacturing strategy development based on quality function deployment (QFD) and provided a methodology related to manufacturing strategy development based on QFD.

OBJECTIVESS OF STUDY

An organization is build up of various departments, where every department has its specific role in keep going of desired accomplishment, as these departments are internally linked and have a customer and supplier relationships. The main objective of the study is to find out the level of satisfaction among the internal customers (employee) within the organization, and to discover the status of the suppliers and customers in terms of their supplied material and services by collecting and evaluating ideas or views and expectations of the internal customers for the improvement in supplier's performance, along with enhancing communication and co-operation between the internal supplier in addition to their customer. In addition to it find out most prominent area of dissatisfaction and tried to resolve it with quality tools. This can be done through Identify the functional problems of the

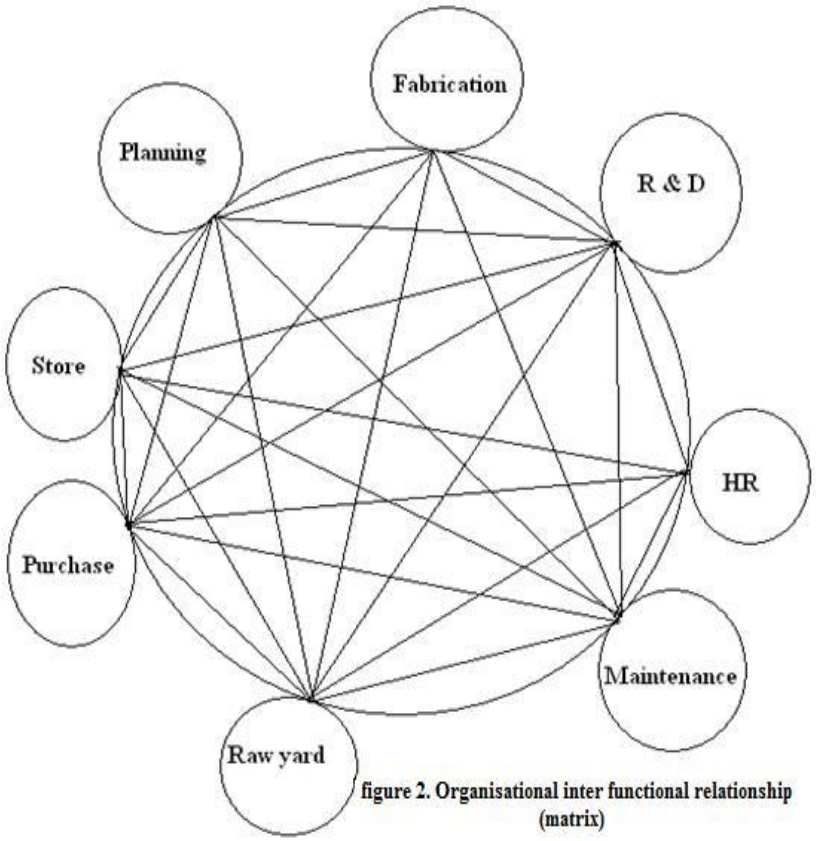

figure 2. Organisational inter functional relationship (matrix)

supplier and customer and Improve the co-ordination between the suppliers and customers by making the internal services more associative. Ultimately improve the customer satisfaction and improved organizational efficiency.

RESEARCH DESIGN

The quality and reliability of research study is dependent on the information collected in a scientific and methodological manner. The research design for this study was in the form of a questionnaire survey. Proper time and attention have given in designing the questionnaire of this research. The survey was conducted in a manufacturing industry between two departments of maintenance and fabrication to find the information related to disparity between the expectations and perceived deliverance of the suppliers, amongst the employees.

Methods of evaluation:

1. The evaluation was in the course of the views and decision of head of the department.
2. Asked the HOD_s to fill up assessment form.
3. Use Filled up questionnaires and cross-examine on various issues.
4. Evaluate department's performance.
5. Checking the level of satisfaction.
6. Prepare the House of quality matrix from the data from the questionnaire and interview.
7. Prepare quality matrix. Find out require areas of development.
8. investigation of efficiency & effectiveness of organization
9. Measuring throughout level of Quality, deliverance, improvement and efficiency.

Sample Design:

In our study the main emphasis was on the questionnaire method. Data were collected through distribution of questionnaire with 10 questions aiming at reducing questionnaire size and then improving the response rate. Question, which were asked in questionnaire, were of multiple choices in nature and were of, closed ended. Personal interview were also conducted. There was face to face conversation between researcher and the respondents. All the answers were recorded while interview was in progress. Through interviewing, additional information was received regarding our study. For the study 5 point scale is used, which are assigned to degree of satisfaction level of the respondent with regard to the effectiveness of service supplied by the supplier and Translating user needs in terms of characteristics that are easy to evaluate on the product.

1	2	3	4	5
Poor	Average	Good	V. Good	Excellent

The responses were collected and analyzed on the above mentioned 5 point scale. The questionnaire measures the perceptions of service in three important areas:

- **Communication**: the ability to communicate and listen effectively within the departments.

- **Productivity**: the ability to maintain high levels of efficiency, reliability and quality among employees.
- **Responsiveness**: the ability to respond effectively to internal customer needs.

The Internal Customer Survey Questionnaire is as follows (**Michał ZASADZIEŃ {michal.zasadzien@polsl.pl}).**

1. Maintenance workers are always available.
2. Repairs/overhauls are conducted in due time.
3. Repair/overhaul time is satisfactory.
4. The time of waiting for maintenance worker is satisfactory.
5. Machines after repair are work satisfactorily.
6. Place of work is clean after repair work.
7. All reported defects are diagnosed fast by maintenance workers.
8. Maintenance staff do inform about delays of deadlines in repairs.
9. The causes of defects are described correctly by maintenance workers.
10. Information about delays in repair is provided.

RESULT AND DISCUSSION:

The information obtained through the survey Questionnaire was arranged in cluster: one group refers to the Internal Customer (employees) requirements ('WHAT') and on the basis of this information Technical or engineering requirement ('HOWS') is prepared. The arrangement of the obtained information is carried to the contribution of every proposal planning at the solution of the problems and requirements regarding customer and supplier relations regarding material supply within the departments. The information obtained allows identifying the most important specifications about Fulfill the requirements of internal customers within the province of organization.Evaluate satisfaction of internal customers and provide a quantitative baseline of Communication and coordination in the house (work place) of the employees and to compare results. Over time these results can be used to compared, standard, *measure* and mark long term trends, which in turn enables fact-based decision making. On the basis of prepared questionnaire, the data gathered on behalf of the internal customer and supplier relationship, subjected to flow of material and information within the organisational province, proceeded for making the House of Quality and evaluates the required conditions. The required House of Quality is as shown below.

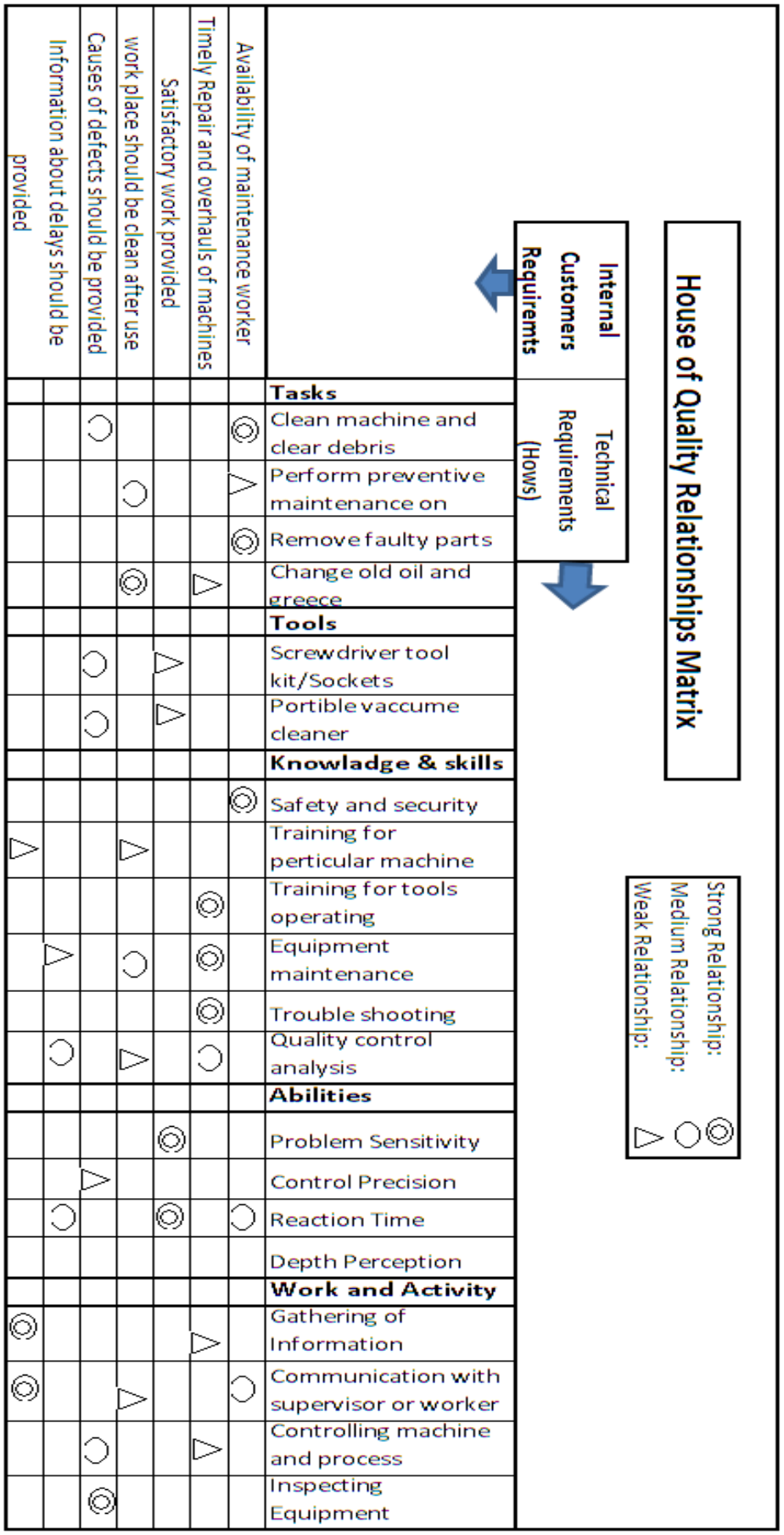

Figure 3. 'HOQ' for assessment of internal customer and supplier relationships in organisation to consider customer & technical requirment.

CONCLUSION:

This study shows that internal customer service with respect to supplier within the organisation computes satisfaction of internal customers (employees) and provides a quantitative foundation to evaluate results. In excess of time these results can be used to assess up to standards, measure and mark long term trends, appraise the internal customer fulfilment to strengthen the company's service orientation, values and goals and which in turn enables fact-based decision making. Assist to direct preparation spend into much essential areas by identifying the vicinity where individual, team and or organization have retards to perform well. And to make the healthy organization in all factors it is needed to identify internal Customer characteristics and their requirements.Relate the customer requirements to the design attributes. Conduct an Evaluation of Competing Products. Evaluate Design Attributes and Develop objectives. In the last to ensure that the list of demanded qualities are complete and expressed at the same level of detail to serve the organisational effectiveness and productivity.

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