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Performance Measurement of After-Sales Services for Automobile Service Centers Using Quality Function Deployment (QFD)

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ABSTRACT

Paramount important factor of an organization is customer satisfaction. Customer satisfaction can be achieved through different quality services to cater customer needs and expectations. In present scenario every organization has to give priority to the customer perceptions. The critical need for continual business development is to understand necessities of quality services and criticalities of performance measurement. Quality function deployment (QFD) is a tool which converts customer needs or Voice of customers into design consideration. The objective of this paper is to measure after-sales services performance of Automobile Service Center using Quality function deployment (QFD). QFD analysis determines and gives output performance result of critical technical characteristics of services

INTRODUCTION

There are several ways to increase the profit of a company. Within a after-sales service corporation, the main aspect that customers look at when determining the quality are the service, quick response, delivery times and cost. The service sector is going through revolutionary change and the future of economy majorly depends on the growth rate of service sector. After-sales service is an important department in an automobile dealer as more than 60% of profits comes from after-sales service. It includes all the services that take place after the automobile has been purchased such as scheduled maintenance service and other repairing, accidental repair including painting works, accessories fitment, rust prevention, spare part function, washing & cleaning. In this current research preventive maintenance of vehicles in an automobile dealership has been considered

Customer Satisfaction is defined by fulfillment of their needs and requirement in time. Customer satisfaction on levels can be measured using survey techniques and questionnaire that is by collecting Voice of customers (VoCs). Gaining high level of the customer satisfaction is very important for a business because the satisfied customers are most likely to be reliable to use a wide range of service offered by a company.

There are many Automobile services center in Indore City in which some service centers are authorized and some are not. When customer is dissatisfied from one service center then he/she moves to other service center. So the main aim of this research is measuring aftersales services performance for Automobile service center to improve satisfaction level of customers by collecting voice of the customer for automobile service center.

LITERATURE REVIEW

Adele Berndt (2009)has used PZB's instrument to determine the Service quality in Vehicle Servicing in South Africa [2]. Katarne, Sharma, Negi,. (2010)Measured Service Quality of an Automobile Service Center in an Indian city [3]. Hussain, Nazim, (2011) measured the quality of service in Atlas Battery by using the Servqual method [4].Praveen S, Devendra S. Verma, (2014) worked to get QFD model to improve service quality using customer needs priorities in a 5-star hotel of Indore. In the research customer satisfaction and importance degree of each need is investigated using survey method [1]. Sharma and Negi. (2014) focused on understanding and substantiate the importance of ranking of Voice of Customers (VoCs) for after sales services in automobile industries [6]. Parul and Shrivastava (2011) applied QFD model and Kano Questionnaires to identify customer needs and calculate customer satisfaction in health services [9]. To suit the different needs of QFD researchers and practitioners, its literature needs categorizing and review. For that purpose, Chan, Lai-Kow., (2002) established a reference bank with about 650 QFD publications [5].

QUALITY FUNCTION DEPLOYMENTS

The concept of Quality Function Deployment (QFD) was introduced in Japan by Yoji Akao in 1966 (Dean, 1998). The principal objective of the QFD process is to help organization and analyze all the pertinent information associated with a project and to use the process to help it select the items demanding priority attention. The QFD process will help focus on the areas that need special attention. The HoQ is a kind of conceptual map that provides the means for inter functional planning and communications. (Hauser and Clausing, 1988). In QFD process a matrix called House of Quality (HOQ) is used to display a relationship between the customer requirements and the technical requirement.(Chuang, 2001; Chan and Wu, 2002).The HOQ provide important information about what areas need to be improved.

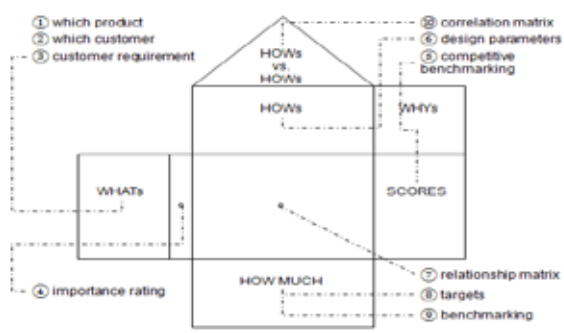

Figure 1 The HoQ showing the "rooms" of the various steps in the QFD process (Govers, C. 1996)

SERVICE QUALITY DIMENSIONS

Researchers have used various dimensions to define service quality. Combining the research by PZB (1988) [7], it was agreed that service quality should be evaluated using five service quality determinants as defined below for an Automobile dealership:

- Reliability: Dealerships are known for fulfilling their commitment regarding time by delivery.
- Assurance: The in depth knowledge of service advisor given confidence/assurance of quality to the customer.
- Tangibles: Tangible dimension include the signage, parking and layout of the dealership.
- Empathy: In dealership, it is the interactions between the organization representative and the customer.
- Responsiveness: This refers to willingness to serve customer on priority basis

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RESEARCH METHODOLOGIES

Selection of service center
Two service Centers (SC) A and B has been selected in Indore city for collection of data or survey related to small car segment for survey

Sample size
Simple random sampling method has been used. The sample size of 100 has been taken. In this the customers who have visited the service center for the servicing and other repair and maintenance work are considered as sampling unit. A questionnaire has been prepared and the Voice of customer was collected. The responses collected through questionnaire on 5-point likert scale.

Data collection and interpretations
The first step in Service quality/performance analysis by QFD is to understand and collect customer requirements or Voice of the Customers (VoCs). It is called 'WHAT' of QFD. It asks the question to documents a list of customer requirements, means customers' are asked to prioritize what they do really need. There are five group of questionnaire each contain two questionnaires. The questionnaire includes the entire different question related to dimension of service quality. Data collected are illustrated in Table-1. A detailed House of Quality for the automobile Service center has been made on the basis of the data collected and is shown in Figure-2. HoQ matrix composed of Technical characteristics i.e. HoWs matrix, Interrelationship matrix and Co-relationship matrix along with the Absolute and Relative weightings of technical characteristics for the automobile service center

Basic Steps for data analysis
Following steps has been performed for data analysis:

a. Competitive Evaluation: The evaluation shows in table-1 the view and satisfaction of customers for a particular VoC for different competitors. Results of customer competitive evaluation are depicted by graph of HoQ Fig.-2. Evaluation shows the lagging position in forth column of Table-1 (i.e. difference) for service center A and service center B for a particular VoC. it shows the direction of corrective actions a service center will take to satisfy the demands of the customers.

b. Improvement Factor: Improvement Factor can be calculated by subtracting the performance score of the service center existing service from its planned performance score i.e. the number of improvement point this difference is multiplied by the increment by 0.2 and this is added to 01 to give the improvement factor. Like for first VoC.

Improvement Factor = 1+ (3.1-2.4)*0.2=1.1

c. Sales Point: A Sales point measure can be used to add eight to those requirements which can be utilized to market the product/service (usually between 1 and 2)

d. Overall Weight: An overall weighting rating to each requirement can be calculating by multiplying the importance weighting by the improvement factor and sales point i.e. OW=IWxIFxSP. Where IW=importance weighting of customer, IF= improvement factor and SP= sales point. Like for first VoC

Overall Weight= (2*1.1*1.3) =2.9

e. Absolute Weight
Absolute weights are calculated for each Technical characteristic by the formula: "Importance weighting of customer is multiplied with relationship value of the corresponding cell then all the values are added". It gives the Absolute weight for that particular characteristic. Like for first Technical characteristics

Absolute Weight = [(3*2) + (9*2) + (3*2) + (1*2) + (3*2) + (3*2)] = 44

f. Relative Weight
Relative weights are calculated for each Technical characteristic by the formula: "Overall Weight is multiplied with relationship value of the corresponding cell then all the values are added". It gives the Relative weight for that particular characteristic. Like for first Technical characteristics

Relative Weight = [(3*2.9) + (9*2.8) + (3*2.5) + (1*2.8) + (3*2.3) + (3*2.5)] =58.6

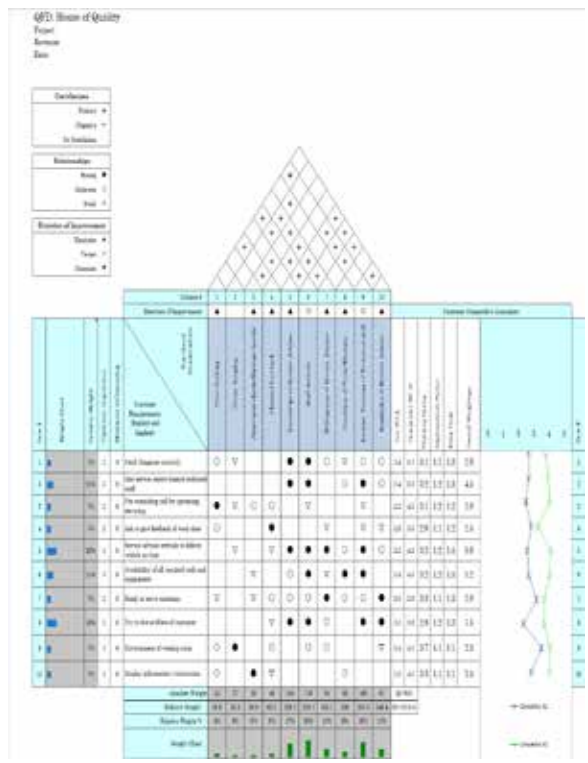

Figure 2: House of Quality for Service center

TABLE 1
CURRENT STATUS OF SERVICE CENTER'S

Customer Demand	VoC Status SC-A	VoC Status **SC-B**	**Difference**
Fault Diagnose correctly (VoC1)	2.4	3.7	1.3
Has service center trained technical staff(VoC2)	2.4	3.9	1.5
Pre reminding call for upcoming servicing (VoC3)	2.2	4	1.8
Ask to give feedback of work done (VoC4)	2.6	3.1	0.5
Service advisor attitude to deliver vehicle on time(VoC5)	2.3	4.1	1.8
Availability of all required tools and equipments (VoC6)	2.4	4	1.6
Ready to serve customer (VoC7)	3	3.6	0.6
Try to live problem of customer (VoC8)	2	3.6	1.6
Environment of waiting room(VoC9)	3.4	4	0.6

Display information / instruction (VoC10)	2.6	4	1.4

RESULT AND DISCUSSION

Table-1 shows the current level of different VoCs of service center under study with its competitor. From the competitive analysis it is clear that rating for all the VoCs is higher in case of SC-B. This means service quality of the SC-B is higher than SC-A. The fourth column of the table shows difference of VoCs ratings for the two service centers. The higher the difference the more is dissatisfaction of customers. The maximum deference of 1.8 is found for VoC3 and VoC5. The second highest difference is of 1.6 for VoC6 and VoC8. VoC2 with rating difference of 1.5 is on third position. VoC4, VoC7, and VoC9 have less deference than other VoCs hence service center A is having advantage in these VoCs. The Quality index of the service center can be determined from the HoQ matrix by using Absolute weight of the technical characteristics. It is 891 for the service center A. from the House of quality the highest value of Relative weight is found to be of Staff Attitude i.e. 279.1, Routine Training of Technical staff i.e. 257.3, and Knowledge of Service Advisor i.e. 238.2.

CONCLUSIONS

The main aim of this study is to assess after-sales services performance of automobile service centers. Quality Function Deployment was used to transform voice of customer's into technical characteristics. A questionnaire containing ten questions has been used for the collection of voice of customer's for the service center. Overall service quality level of the service center A under study found very poor. The most dissatisfaction is found to be for Pre reminding call for upcoming servicing (VoC3) and Service advisor attitude to deliver vehicle on time (VoC5). The two important weights have been calculated for assessing the quality index of the service center. The higher the value of Relative weight shows the critical technical characteristics of the service center. From the analysis the most critical technical characteristics are found to be Staff Attitude, Routine Training of Technical staff and Knowledge of Service Advisor. The methodology proposed in this paper is help-full to evaluate the performance of any service center with certain modification in the questionnaires design with respect to the service center under consideration.

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