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Integrated Kano Model and QFD in Designing Passenger Car

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ABSTRACT

Now a days cars are necessity of everybody's life and are not luxury. The growing economy of the country has increased tremendous demand of vehicles particularly passenger car. The competition in car market has been rocketed up resulting customer satisfaction become a key factor for business success.

QFD starts with customer need in order to achieve their optimum satisfaction. QFD is co-relating data about customer's attribute and technical attribute. The integration of Kano Model supports QFD towards innovation and improvement of the product. It helps to adopt changes in view to achieve satisfaction and delight the customer. The Kano Model also helps to understand the types of the customer expectations and satisfaction.

Keywords: *Kano Model; QFD; Passenger Car.*

1.0 Introduction

During last few years, sales of passenger car in India has recorded a strong domestic sales growth. In the fiscal year 2015-16 as per SSAI, 23,960,940 vehicles including passenger car are rolled out. Out of that, the overall passenger car sales was 13% market sale. The competition for passenger car markets as well as numbers of customer rocketed, therefore, the customer satisfaction also become a key factor for business success. The impact on customer requirements to satisfy them. Changes due to fact that competitors introducing new features in the existing product frequently.

2.0 Review of QFD Methodology

Quality Function Deployment is one of the best approach to convert the customer needs into quality characteristics in order to develop a design quality of the product. This methodology applies data about importance and customer satisfaction by identifying customer attributes. This is an important tool to transfer the voice of the customer in to the product specification. The concept of QFD was first introduced by Dr. Yogi Akao in 1966 and developed

during 1970's. At USA, it was introduced and adopted in 1983.

Q.F.D. is customer oriented approach which helps product designer in developing new product by providing data of customer needs. Most of the conventional technique that aimed to time out relative importance between requirements, including assuming that customer have previous knowledge about the product and its attributes (Deszle et al. 1999). Once the customers requirement are identified, a set of design attributes are correlated in a matrix known as "House of Quality". The output of that is useful to establish. The competitive target with respect to customer voice with certain priorities that helps to increase the customer satisfaction.

The first step of the methodology is to capture the basic needs of the customer i.e. "what".

On identifying the requirements, a quantitative market research is essential to know the competitive position of the product in terms of customer's satisfaction. Also to evaluate the importance of their requirement as expressed by the rider. A set of design attributes that could fulfil their needs is worked out.

Next is to translate the voice of the customer to technical attribute. Therefore it is essential to refine the vague ambiguous needs of the customer prior to

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transform into measurable technical requirements. Thereafter appropriate and feasible relationship between customer attributes and technical attributes is established with the help of "House of Quality" metrics.

The result thus obtained is applied while designing the product (2.2) KANO MODEL.

The customer seldom speaks with basic quality issues of the existing product. The conventional Q.F.D. process assumes that the relationship between importance and satisfaction are linear and independent several studies have shown that relationship between

importance and satisfaction is not always linear (Anderson and Mittal 2000; Ting and Shah, 2002; Tortini & Silveira 2005). Kano Model (Kano et al.; 1984) suggested analysis of improvement opportunities in product considering that relationship is non linear.

3.0 QFD: SWOC Analysis

The quality of product is too much dependent on how well the rproduct fulfil the customer need. Q.F.D. is one structured approach to translate the voice of customer which become driver for the design and development of the product to satisfy the requirement of a customer.

This method is in relatively easy to apply and highly flexibile & customerable (Dey 1993) summarizes some of the key issues of the QFD concept as :-

- QFD is a planning process as opposed to a tool for problem solving.
- The customer wants & needs - their requirements are the inputs to the metrix. The process can not begin without those inputs. QFD essentially forces an organization to get in touch with the people who use the product.
- It uses a metrix to display information vital to the project in brief outline format.
- This collection of information in the metrix format facilities examining cross checking and anlysis. It helps in organization set competitive targets and determine the priority action issues.
- The out put resulting from analysis of QFD metrix in two fold. First the competitive forgets are established for key action item related to the customer's voice. Second, certain priority issues are selected for special emphasis. An effective response to the targets and to selected priority

issues will result in increased customer satisfaction. In view to aseess the success QFD methodology, it is essential to understand how the success can be obtained. There are many success stories pertaining to the application of QFD in design & development of product. The researchers must aware about strength, weekness, opportunity & constraints regarding use of QFD technique before adopting it Revelletal (1998) present an analysis to understand the ground realities of the process.

The Kano Model classific customer requirments under three categories -

- **Basic requirement-** which fulfills the basic function of product. In absence of that, the performance is not sufficient to satisfy the customer. Moreover, if sufficient performance is there, the customer may not be satisfied.
- **Performance Requirement -** In this case the customer satisfaction is proportional to the performance level. The customer satisfaction will increase or decrease as per performance level.
- **Excitment Requirement -** These are meant for delighting the customer. The features present in the product beyond the expectation of the customer will delight. On the other hand, in absence of that customer do not mentioned dis-satisfaction.

4.0 Role of QFD and Kano Model in Design Passenger Car

Product Life cycle of passenger car in the country is dependent on Life style of the people, growing economy and availability of production infrastructure.

Now the days customer have become more selective and understand various technical attributes of the product with competitive cost. Therefore identification of excitment, basic and performance requirements have become major issues to attract customer.

Tan and Pawitra (2001) propose integrating Kano Model in the QFD (2001) determine Kano Category for each requirement.

These categories can be organised as per customer requirement to cape with Basic performance, excitment and neutral.

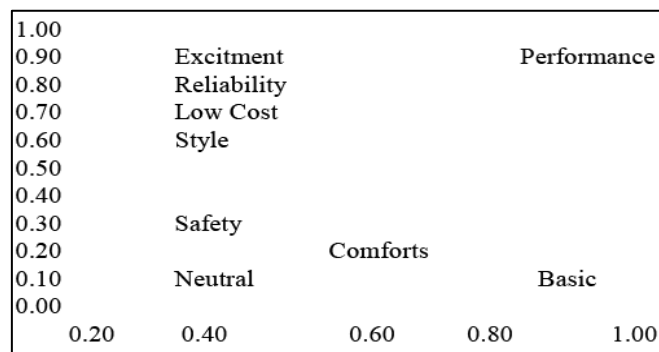
Table 1: Classification of Requirements as Primary, Secondary and Territory.

S.No.	Primary	Secondary	Territory
1.	Reliability	Vehicle Performance	Upgraded Power Transmission Pick up Millage acceleration Maximum speed Torque Engine Capacity
2.	Safety	Passenger Feel Safe Safe in accident Meet Regulatory Requirement	ABS Bags Indicators
3.	Comforts	Extra for passenger Enough Legs Room Comfort for Long Riding AC and Heater System	Night Vision Lamp fog lamp Rear view camera Rigid Design Ergonomically Designed Seats
4.	Cost	Purchase/Replacement Cost Service Cost Operating Cost	Low Low Low

Berger et al. (1953) proposed Customer Satisfaction Coefficient (CSC) which shows the percentage of the customer get satisfied as well as dissatisfied with positive and negative question respectively. That is shown in the scotter diagram in different quadrants as specified in figure 3.

The CS coefficient shows how strongly a product requirement influences customer satisfaction or vice-versa. QFD process is applied towards importance rating and performance, compasred to the competitors to as certain the most optimum level of customer satisfaction.

Table 2: Coefficient of passenger Car for customer satisfactio (CSC) [8]



5.0 Conclusions

Automobile market today has become most lubricative market in the country. With growing economy and raising quality life of people are the main driver of competable market. The success of business now depend on satisfaction of rider.

The Kano Model can help business to fulfill basic, performance and excitment related requirements to achieve optimum satisfaction of the customer. This paper shows various organised customer requirement. The integration of Kano Model in QFD helps to open perspective innovated product with now features.

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