



## Identifying and prioritizing customer requirements from tractor production by QFD method

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### Introduction

Discovering and understanding customer needs and expectations are considered as important factors on customer satisfaction and play vital role to maintain the current activity among its competitors, proceeding and obtaining customer satisfaction which are critical factors to design a successful production; thus the successful organizations must meet their needs containing the quality of the products or services to customers. Quality Function Deployment (QFD) is a technique for studying demands and needs of customers which is going to give more emphasis to the customer's interests in this way. The QFD method in general implemented various tools and methods for reaching qualitative goals; but the most important and the main tool of this method is the house of quality diagrams. The Analytic Hierarchy Process (AHP) is a famous and common MADM method based on pair wise comparisons used for determining the priority of understudied factors in various studies until now. With considering effectiveness of QFD method to explicating customer's demands and obtaining customer satisfaction, generally, the researchers followed this question's suite and scientific answer: how can QFD explicate real demands and requirements of customers from tractor final production and what is the prioritization of these demands and requirements in view of customers. Accordingly, the aim of this study was to identify and prioritize the customer requirements of Massey Ferguson (MF 285) tractor production in Iran tractor manufacturing company with t- student statistical test, AHP and QFD methods.

### Materials and Methods

Research method was descriptive and statistical population included all of the tractor customers of Tractor Manufacturing Company in Iran from March 2011 to March 2015. The statistical sample size was 171 which are determined with Cochran index. Moreover, 20 experts' opinion has been considered for determining product's technical requirements. Literature and theoretical bases of this study have been collected with research paper tab and the research data has been collected through four researcher-made questionnaires and interview tools. The questionnaire Type 1, used for determining the most important demands and needs of customers based on five choices Likert scale. The questionnaire Type 2 was for gathering data requirements to hierarchical AHP method, and the questionnaire Type 3 was for doing some evaluation about organization's present situation related with competitor's situation based on customer's demands and needs; and the questionnaire Type 4 had been implemented for finding technical requirement weights respect to customer's demands and needs. The reliability of the type 1, 3 and 4 questionnaires determined by Chronbach's Alpha method; after gathering required data for mentioned statistical test, these questionnaires' reliability rates are obtained: 0.768, 0.784 and 0.793, respectively. As well as, the validity of the questionnaires has been examined with content validity method. In this research, for analyzing the gathered data, while taking into account the different stages of QFD method, t- student statistical test was used for identifying the needs and demands of customers, and AHP was used for determining the priority of needs and demands of customers.

### Results and Discussion

The results of one sample t-test for identifying the customer's most important demands and needs showed that the factors such as: producing low price tractor, the quality of used auto-parts, sustainability and long-lasting the final production (production life and durability), comfort and peace during work, creating operator cabin,

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easy access to spare components, the amount of fuel consumption, warranty and maintenance, easy access to official repair stations, technical experts and suitable auto-parts, fast respond of brake system during braking and smooth moving identified the important demands and needs of customers. The results of AHP method for determining primary priorities of perceived customers needs and demands revealed as follows respectively: quality of parts, warranty and maintenance, low price, fuel consumption, comfort and peace, life and durability, smooth moving, fast respond of brakes, creating operator cabin and easy access to spare components. Finally, the main demands and related technical requirements have been identified and prioritized with QFD method; the Final results of customer demands and needs by QFD method revealed this prioritization: Quality of Parts, Warranty And Maintenance, low price, Fuel Consumption, Peace and Comfort, Life and Durability, Smooth Movement and lower engine knocking, Fast Respond of Braking System, Creating Operator Room and Easy Access to Components.

## Conclusions

Without any doubt it is obvious that the obtaining customer satisfaction is the most important strategic tool for having successful and highly developed industry in this era. Knowing the customer demands and needs can lead the organization to enhance competitive advantages. This research showed that how could use structured QFD method for identifying prioritization of tractor customer demands and needs for maintain their satisfaction, and identifying importance of each demands, considering the production techniques.

**Keywords:** Customer needs, Quality, Quality Function Deployment (QFD), Technical specifications, Tractor