

Quality Function Deployment for Designing Bottle Holder

Prof. Avinash Chavan¹, Prof. Sandeep Jadhav², Prof. Amol Bhagat³

¹Asst. Professor, Mechanical Department, SCOE, Kharghar, Navi Mumbai, India, avi.d.chavan@gmail.com

²Asst. Professor, Mechanical Department, SCOE, Kharghar, Navi Mumbai, India, sandeepjadhav2020@gmail.com

³Asst. Professor, Mechanical Department, SCOE, Kharghar, Navi Mumbai, India, amolsbhagat@gmail.com

Abstract: Bottle holder is a need of long journey passengers. Passengers are having some set of expectations regarding bottle holder. Passenger expect that the bottle should hold multiple size of bottles. As well as he demands for low price and durability. Few passengers expect thermally insulated bottle holder. But it is designers choice that what customer expectations should be fulfilled. Hence QFD (Quality function deployment) Approach helps to transform customer requirements into design specifications. The QFD is explored through House of Quality where different rooms lead certain characteristics aiming towards transformation of Customer requirements of Bottle Holder into exact design specification satisfying such requirements.

Key words: Quality function deployment, House of Quality.

INTRODUCTION

Quality function deployment (QFD) is a planning and team problem solving tool that has been adopted by a wide variety of companies of options for identifying design engineer's attention on fulfilling customer expectations through the product development process. [2]

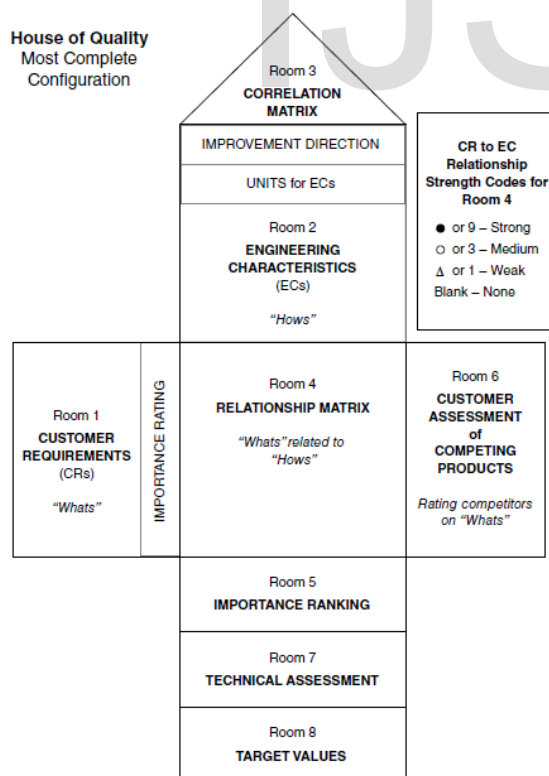


Fig. 2: House of Quality in QFD Methodology

The word deployment in QFD regards to the fact that this method determines the vital set of needs for each product development and uses them to identify the set of technical characteristics of each stage what most share to satisfying the needs. QFD is a mainly graphical output that helps a design team in systematically identifying all of the elements that go into the process of product development and formulating relationship matrices among key parameters at each step of the whole process. Gathering the information required for the QFD process forces the design team to answer questions that might be or might not be highlighted over a less complex methodology and to learn what it does not know about the problem. Because it is a group decision-making activity, it formulates a higher level of group understanding and buy in the problem. QFD, like brainstorming, is a tool for multiple stages of the design process. In fact, it is a complete process that provides input to guide the design team as shown in fig. 2. [2]

PREPARATION FOR QFD WITH UNDERSTANDING CONCEPTS

The complete QFD process [3] is diagrammed in fig. 2 Here are three attributes of the QFD process are described. It is clear why the phases of QFD, especially the first, product planning, are called houses. Second, the QFD process is made up of four phases that proceed in sequence and are connected as a chain with the output from each phase becoming the input to the next. The product planning phase of QFD, called the House of Quality, feeds results into the design of individual parts, giving inputs into the process planning design stage, which become inputs into the production planning phase of QFD. For example, the important engineering characteristics determined by the House of Quality become the input for the part design house. Third, the QFD process is created to transform or map input requirements to each house into the characteristics output from the house. Since QFD is a connective, sequential, collective as well as transformational process, the first set of inputs strongly affects all further transformations. Hence the QFD process is identified as a methodology for pervading the voice of the customer into each aspect of the design specifications. The House of Quality develops the relationships between what the customer wants from a product and which of the product's features and overall performance parameters are most critical to fulfilling those wants. The House of Quality translates customer requirements into generally quantifiable design variables, called engineering characteristics. This mapping of customer wants to engineering characteristics informs the remainder of the design.

IMPLEMENTATION OF QFD METHODOLOGY FOR BOTTLE HOLDER

The Quality function deployment helps to identify important engineering characteristics which need to put emphasis for product development creating competitive impact also. It involves different rooms of House of Quality [5].

House of Quality: House of Quality having relationship matrix of engineering characteristics (EC) and customer requirements (CR) along with that correlation matrix of EC itself. At the same time various houses are involved in direction of advancement, importance weighting and ranking of EC for giving weight to increase effectiveness. Exact gap is found and target is set accounting competitive impact.

In the room of customer requirement are found like ability to hold multiple sizes of bottles, durability, cost effective, multiple colours, heat resistance found from the survey made with the customer and in the room of engineering characteristics like production cost, size adjustability, expected life, material strength, material cost, manufacturing in multiple colours, in multiple colours,.

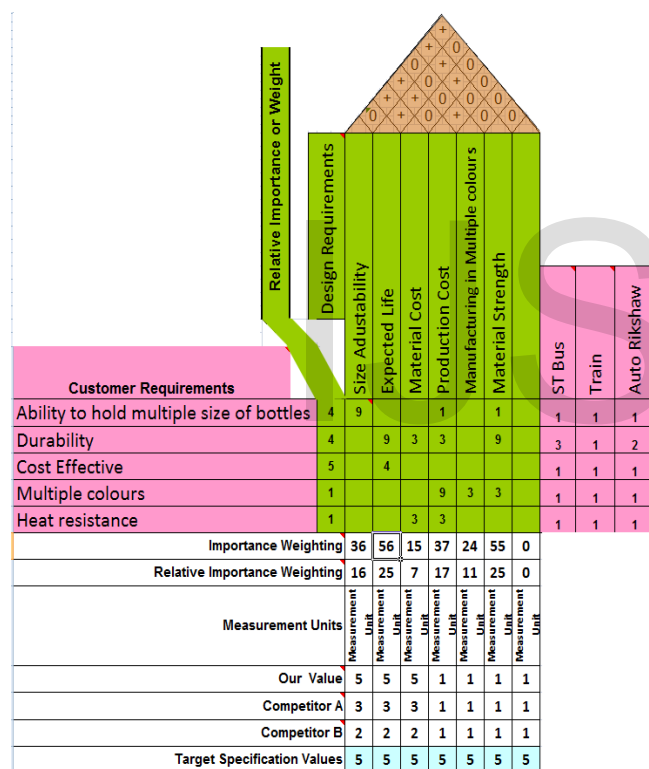


Fig. 2: QFD Methodology implementation for bottle holder.

Then in the matrix where they collide there is mentioned their relationship in numbers from 1, 3, 6 or 9 representing relationship from weak to strong. At the importance rating their importance is found while comparing with themselves between 1 to 5.

Similarly competitive bottle holders existing are also compared and rating is given to them on the basis of degree of fineness of customer requirements. In top room the engineering characteristics are correlated to each other and their respective rating is mentioned.

OUTCOMES OF QFD METHODOLOGY

Wattage for each engineering characteristics is calculated and ranked them. The engineering characteristic having more wattage such has to prioritise during design. QFD Methodology effectiveness would be assessed that material strength & expenses of production is having greater weighting of 27 and 18 respectively. Hence they have to be given additional wattage for fulfillment of CR. Then only CRs of ability to hold multiple size, durability and cost effective can be fulfilled. Now the possible solutions are innovated or invented focusing on target ECs.

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