

A QFD-TRIZ Hybrid Method for a Portable Foldable Table Design

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ABSTRACT –This study is to improve the design for foldable table space saving for the night market worker. The requirements of the function, structure and user requirements are considered and applied to the design while redesigning the product. To ensure that the design of the portable foldable table is in accordance with the target market, through a market survey, we integrated the QFD and TRIZ methods to find out the suitable design improvement direction. After the design validation, Molte Funzioni Portable Foldable Table has shown (more than 50% satisfaction) that it fulfils all the requirements that the night market worker wants. And using the integrated QFD and TRIZ method can meet both the user needs and innovation.

1. INTRODUCTION

In this project, some problem statements related to portable foldable table have been considered. The first problem is that the table commonly used by vendors cannot be carried around easily which cannot be conveyed by hand [1]. This causes difficulty to the vendors to move the table from one place to another. The next problem is the inability of portable foldable table to withstand high load [2]. The tables generally made from plastic or thin plywood which can easily break and cannot withstand heavy load. The last problem is most of the portable foldable table in market does not have essential features that could facilitate night market's worker. One of the features that the night market worker might need is the storage where they can put their money safely rather than just putting them in a basket on the table which is not safe. And another feature is the adjustable table height, so that when they sit the table is not too high and when they stand the table is not too low which can hurt their back and cause discomfort.

From the problem statements, the designer came up with ideas to solve the problems faced by the night market workers, which translated into the objective of this project which is to improve the space-saving function, design, and attributes of the portable foldable table by using the combination of the QFD method and the TRIZ method. In addition, in designing and solving the problem, it is necessary to use the integrated QFD method and the TRIZ method to ensure the portable foldable table able to withstand the weight of variety of things in the product design and development process. Lastly, is to overcome the difficulties due to the existing traditional furniture and the current portable foldable table by improving the function and attributes of

portable foldable table. By following all the steps and understand all the methods used in this project the designer could solve all the problem statements stated earlier. All the problem statements and objectives need to be solved and achieved in order to make the project successful.

2. METHODOLOGY

The development of this study can be divided into four stages. The first stage is Data collection. The second stage is Data Analysis to establish the customer requirement for the product design features. Here, the questionnaire survey to investigate the user requirement was carried out. The third stage is Product Development where is to start to use both methods QFD and TRIZ. The tools that are being used in the QFD is HOQ, while the tools for TRIZ is 39 general engineering parameters and 40 inventive principles. Then from that the designer could get the design direction in making the portable foldable table. The last stage is Design Validation. After the final design selection and prototype making will invite the user to test the function of the design and improvement to validate whether the design achieves the user's needs or not.

3. RESULT AND DISCUSSION

In finding the customer requirement or user need for the portable foldable table, the questionnaire survey has been made. The purpose of this questionnaires survey is to know the customer requirement. This is to make sure all the specification and criteria in the portable foldable table followed the specification that users want. After implement the result of the survey, the designer needs to put all the criteria of the customer requirement in the HOQ and find the negative correlation of the technical requirement which all strong negative correlation and negative correlation need to be solve. Figure 1 shows the HOQ which shows the strong negative correlation and negative correlation of the technical requirement. So basically, there are 7 negative correlation that could be identify. Then the designer needs to integrate the TRIZ method by connect all the technical requirement with the suitable parameters in 39 General Engineering Parameters. All the parameters that being stated then need find a tentative correspondence between TRIZ parameters that stated in the Table 1.

