



## SERVICE EFFICIENCY IMPROVEMENT OF WARUT BODY & PAINT CO.LTD. TO MAXIMIZE THE CUSTOMER SATISFACTION BY USING QUALITY FUNCTION DEPLOYMENT

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### Abstract

This study aims at using QFD (Quality Function Deployment) which utilizes the quality functions of product or service in planning process and executing measures to increase the efficiency of Warut Body & Paint Co.Ltd., Khon kaen with the objectives to maximize satisfaction and minimize the undesirable problematic elements by QFD techniques. Starting from using effective questionnaire to collect the demands or voices of customers (VoC) for transferring to technical elements of the processes or services. Then the major quality elements of services were identified for improvement by construction of the House of Quality (HoQ). The major important quality elements were prioritized as follows (1) the punctuality of finishing up of the works, (2) rapid and accurate cost estimation, (3) certified work insurance, and (4) the car paint quality, of which the most weighted element is the punctuality of finishing up of the works (21.2%). The company could propose the improvement of service efficiency by stating the finish-up duration of all works within 5 days after taking up the car, so that the customers would get the profound satisfaction for the prompt and faster service.

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**Keywords :** car service efficiency improvement, QFD, customers satisfaction

## Introduction

Some regularly found issues in the Warut Body & Paint Co.,Ltd which provides a series of maintenance procedure, viz. car body reparation, spraying and painting cars are such as unstandardized coloring, irresponsibility, unimpressive service and unpunctual delivery. These problems have eventually caused customers to become unsatisfied in service quality. With the aim to improve its service efficiency as well as to meet the customers' profound satisfaction, the Warut Body & Paint Co., Ltd. decided to use the Quality Function Deployment technique (QFD) in its management and made it even better in order to meet the needs of customers who regularly come for services. This is to make the company to a more effective garage and finish up its service works with high quality to the high degree of satisfaction, specifically the short service duration (< 5 days) or (=5days).

The scope of this study covers the use of tools in Quality Function Deployment (QFD) to obtain the voice of customer who come to have services in a series of maintenance procedure, e.g. car body preparation, painting with standardized color, neat and clean finish up work with punctual delivery. The study uses thirty questionnaires for customers and five questionnaires for the company's competitors. The requirements or voice of customers are tabulated and the characteristics of planning, process and control measures are then weighted into the House of Quality table, while the parameters obtained from the competitor companies are also compared. This is carried out with the final goal to achieve the maximum customer satisfaction for the Warut Body and Paint Co.Ltd.

### Definition .:

Quality can be defined as "a predictable degree of uniformity and dependability, at low cost and suited to the market." [1] Quality has several dimensions, e.g. performance, serviceability, response, aesthetics and reputation.

Quality Function Deployment (QFD). "It refers to a system with the aim of translating and planning the "voice of customer" into the quality characteristics of products, processes and services in order to reach customer satisfaction" [2] QFD is not only a quality tool, but also an important planning tool. It allows the consideration of the "voice of the customer" along the service department path to market entry.

QFD was originated in the late 1960s to early 1970s, in Japan, by Professor Yoji Akao [3] and Akao [4] defined QFD as a method for developing a design quality aims at satisfying the customer and then translating the customer's demands into design targets and major quality assurance points to be used through out the production stage. The QFD system has been used by Toyota since 1977, following four years of training and preparation. Results have been impressive. Between January 1977 and April 1984, Toyota Autobody introduced four new van-type vehicles using 1977 as a base Toyota reported a 20% reduction in start-up costs on the



launch of the new van in October 1979, a 38% reduction at November 1982, and a cumulative 61% reduction at April 1984. QFD has not been only the very effective tool for new product development but it is also highly beneficial for service industry, e.g. the service for the department of ear, nose and throat in Songklanagarind Hospital.[5] improving mobile services design.[6] QFD implementation in hospital housekeeping services.[7], etc. The starting point of any QFD project is the customer requirements, often referred to as the non-measurable. These requirements are then converted into technical specifications. This stage is referred to as the engineering characteristics or measurable. The QFD process involves four phases: (1) Product planning: house of quality.(2) Product design: parts development. (3) Process planning and (4) Process control.

Referring to figure 1 The House of Quality, the structure of the house and the relationship of each component consist of:

**A) The Left Wall (Customer Requirement).**

On the left is what customers expect from the products (Voice of Customer).

**B) The Right Wall (Prioritize Customer Requirement).**

On the right is the priority of what customers require (Planning Matrix) which can be separated into such categories as customer testing, grading point of sale and so on.

**C) The Ceiling (Technical Descriptors)**

Ceiling (or the second floor) is the technical details (Technical Descriptor or the Voice of the Organization) in accordance with product specifications in terms of engineering design parameters.

**D) Inside the Room or a House Body**

The inside room expresses the connection between customer requirements and technical details. Simply to say, it is a translation of customer requirements into technical specifications.

**E) The Roof (Interrelationship between Technical Descriptors)**

The roof of the house shows the relationship between the various technical details. It presents assimilation that determines the differences of technical details.

**F) The Floor (Prioritized Technical Descriptors)**

Floor is the technical details being already prioritized. For example, a comparison with competitors, rate of difficulty and the value of goal. Our duty is to input data into each part of the house.

## Objectives

1. To employ the QFD (Quality Function Deployment) as a technique in the process of planning and increasing the company's efficiency as well as obtaining the highest efficiency in

repairing, maintenance, spraying and painting the cars so that customers' ultimate satisfaction can be met., e.g..short duration to finish up work (<5 days), precise paint mixing, cars are neat and clean.

2. To reduce the issues mostly unsatisfied by customers to its minimum level. These can be attained by working on through the standard sequential steps in QFD methodology.

## Research Methodology

### 1. Population and Samples

Population and samples used in the study were customers who brought in the cars for reparation, maintenance, spraying and painting services as well as five operators of other companies who ran the same business.

### 2. Data Collection

This research has employed the QFD effective questionnaires as the tool to collect data from the random thirty customers who brought in the cars for services at the Warut Body and Paint Co., Ltd. and five operators of other companies who ran the same business.

Data obtained from the questionnaires were then concluded into elements of quality to see how concentrate they were. This was done by means of a house of quality technique. The method for calculating the constructed matrix, an X axis, a Y-axis, the relationship of quality elements and the scale from 1 to 5 was done by adding scores into the house of quality in the application program, Excel. Changing numbers and variables in the program would have to be made as necessarily required before letting the computer do all the rest of calculation for us. What customers satisfied most and what we would do and make it more effective from the resources available in the company in order to meet the customer satisfaction were weighted and calculated into figures as shown in Figure 2 where by 1 means dissatisfaction and 5 means the most satisfaction.

## Results

The information obtained from the questionnaires were listed as the voice of customers according to priorities. They were weighed in as the component characteristic deployment matrix, and could be observed in Figure 2 (HoQ).

The customer satisfaction according to priorities and their technical requirements are listed in Table 1.

## Discussion and Suggestions

Referring to figure 2 of the House of Quality when Input with quality elements and planning matrix, it could be concluded that:



1. What customers required most and what needed be improved in order to increase service efficiency was a complete and on-time maintenance. The times for repairing from the beginning until the end should be indicated with a certain period – decisively not over five days, with the weight of 1,413 or 21.2% that leads to the customer impression as a result of fast services could be obtained.

2. An accurate and fast appraisal was made with the weight of 1,113 or 16.7%. What needed to be improved in order to increase efficiency was the installation of the Electronic Claim System (E-Claim) to refer the matters to the respective insurance companies so that notification of appraisal could be immediately made to customers.

3. There was guarantee of repair work with the weight of 1,081 or 16.2%. The company must issue a warranty on the repair according to the list of items notified – normally three months but increased to six months. This was to make sure that the cars brought in for services by customers were high in standard and quality.

4. Quality of colors had the weight of 999 or 14.96%. To increase efficiency, the company must carry out measurements on color pigment and resolution in order to assure technical requirements needed by customers. What needed to be improved was the color measuring system by the computer system. This could be implemented by purchasing a notebook computer installed with an update version of Dupont program so that measurements on color pigment and resolution could be accurately made.

5. Office hours from 8.00 - 17.30 hrs. had the weight of 977 or 14.63%. The company must provide operators throughout its working hours so that customers could make a contact with the company at any time.

6. Cleanliness and neatness inside the car had the weight of 582 or 8.72%. The company must provide a car wash before delivering it back to the customer.

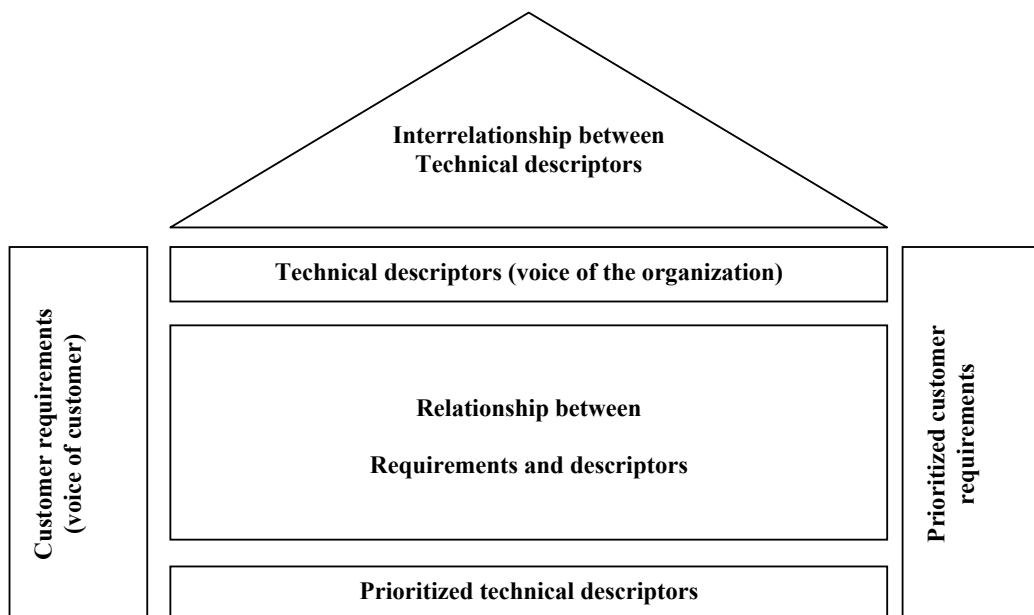
7. Regarding hospitality, service and consultation, the customers were well taken care of by friendly employees. There were provisions of lounge, coffee, tea, Ovaltine and drinks for customers while waiting for services. The weight for these was 511 or 7.6%. Employees of the company must give advice to their clients with minded and proper manners. The company must train employees with new and update information so that the customers could be ensured of quality services provided and with sustainability and forever.

The results of this research and the implication could satisfy and meet the targeted objectives, particularly item 1 to4. However, the size of population was rather low; it could be doubled to 60 customers.

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**Figure 1** The House of Quality. Retrieved on August 12, 2014 from <http://www.rmuti.ac.th/faculty/production/ie/html1/QFD>.



**Figure 1** The House of Quality

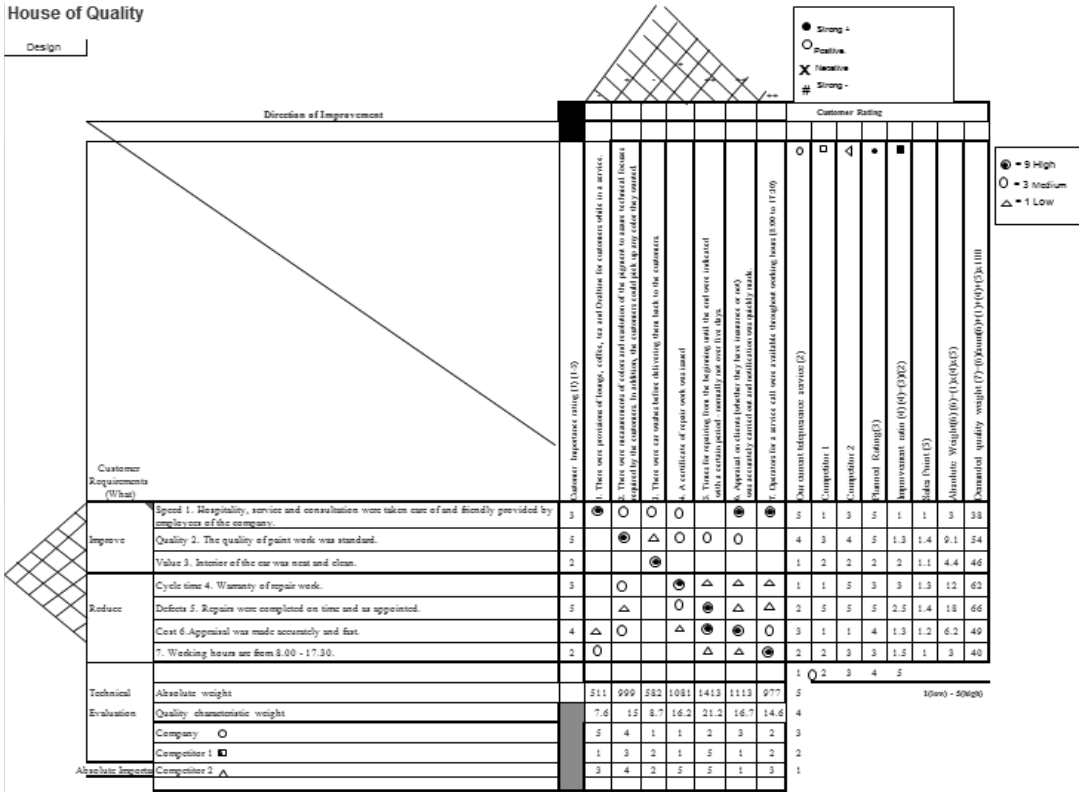


Figure 2 of a House of Quality when Input with Values.

**Table 1** The Relationship between Customer Satisfaction and Technical Requirement.

Customer Satisfaction	Technical Requirements
Repairs were completed on time and as appointed.	Times for repairing from the beginning until the end were indicated with a certain period - normally not over five days.
Appraisal was made accurately and fast.	Appraisal on clients (whether they have insurance or not) was accurately carried out and notification was quickly made.
Warranty of repair work.	A certificate of repair work was issued according to the list of items notified.
The quality of paint work was standard.	There were measurements of colors and resolution of the pigment to assure technical focuses required by the customers. In addition, the customers could pick up any color they wanted.
Working hours are from 8.00 - 17.30.	Operators for a service call were available throughout working hours (8:00 to 17:30).
6. Interior of the car was neat and clean.	There were car washes before delivering them back to the customers.
Hospitality, service and consultation were taken care of and friendly provided by employees of the company.	There were provisions of lounge, coffee, tea and Ovaltine for customers while in a service.