

## QUALITY FUNCTION DEPLOYMENT AS A STRATEGIC PLANNING TOOL

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### —Abstract —

Quality Function Deployment (QFD) uses a house of quality to translate customer requirements into engineering specifications. QFD has been widely used as a tool to develop new products. It has been adopted in the fields of education quality, service quality, software development and marketing planning. The tool has recently been applied in strategic planning. In this study authors reviewed current research which uses QFD as a strategic planning tool and described how QFD methods can be used as a robust tool in strategic planning. This study provides an insight for strategic planners to utilize a QFD- based philosophy and the methods are useful tools for the design of a customer-driven strategy and show how it systematically translates vision into action, targeting opportunities and creating innovative strategies.

**Key Words:** *strategic planning, QFD, customer satisfaction*

**JEL Classification:** L10

### 1. INTRODUCTION

Globalization and dramatic economical changes has led to intense competition. Customer satisfaction is a key point for any enterprise to survive in this competitive environment. Strategic planning is a fundamental step to keep the customer satisfied.

Hunt and Xavier (2003) presented the main characteristics of strategy as follows:

- Takes a long term view,
- Includes defining vision, mission, objectives and goals.
- Provides the basis of selection between options (e.g. courses of action, allocation of resources)
- Requires the consideration both internal and external environments.
- Involves the participation of entire organization.

The enterprises should design their strategies across functional departments in a collaborative environment in order to satisfy their customers.

Quality Function Deployment (QFD) is a methodology to translate customer requirements into the final product or service characteristics. It focuses on customer needs determination and organization-wide commitment to satisfy these needs in the long term .QFD is systematic approach that can be applied to the strategic planning process (Walker, 2002).

The purpose of the study is to present a framework to apply QFD in the strategic planning process. The framework can help strategic planners to design their customer- driven strategies and also help deploy the strategies in a systematic way.

The article is organized as follows. In the first part, the importance of strategic management and traditional strategic planning tools are given. QFD methodology is explained in the second section. The third section describes how QFD can be used in strategic planning. Concluding remarks is given in the last section.

## **2. STRATEGIC PLANNING**

Strategic Planning includes the analysis, decisions and actions an organization undertakes in determining its long-run performance. To create and sustain a competitive advantage among other firms, strategic competitiveness is emphasized. As mentioned by Hitt et. Al (2001), strategic competitiveness is maintained ‘when a firm successfully formulates and implements a value-creating strategy’. Strategic planning helps to decide on strategies that provides advantages that can be sustained over time (Dess and Lumpkin, 2003). Other attributes of strategic planning mentioned by the authors include: direction towards organizational goals and objectives, inclusion of stakeholders in the decision making process, incorporating short/long term perspectives and recognizing trade-

offs between efficiency and effectiveness. The strategic management process includes strategy analysis, strategy formulation, strategy implementation and evaluation. This process is summarized in Figure 1 respectively.

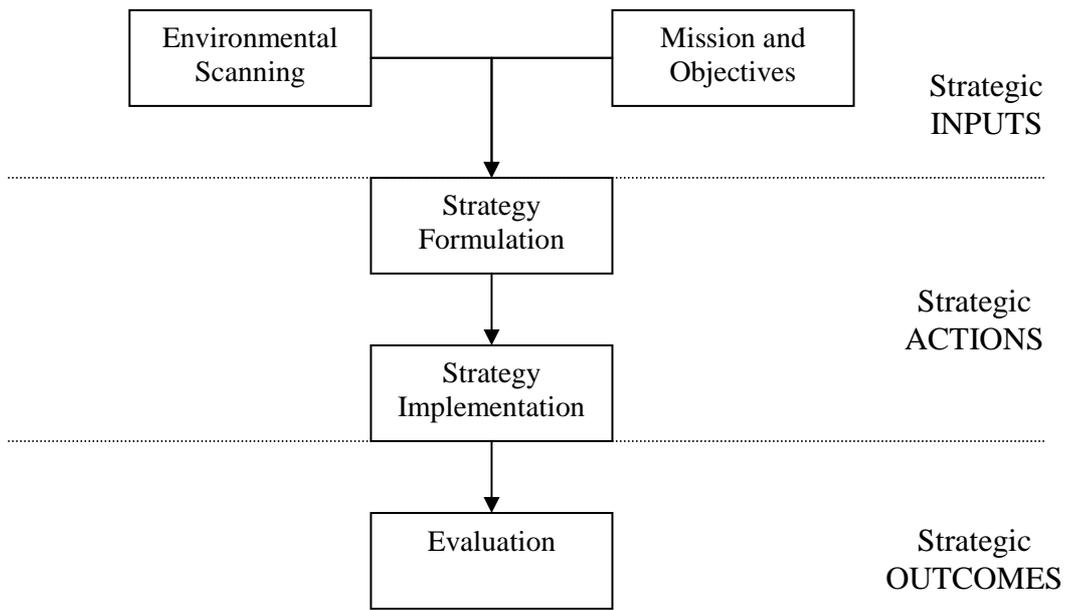
Strategy analysis, formulation and implementation consist of five interrelated managerial tasks as defined by Thompson and Strickland (1999). These include:

- 1) Assessment of where the organization is and where it is headed and thus forming a strategic vision for future activities.
- 2) Setting objectives by converting the strategic vision into performance outcomes the company seeks to achieve.
- 3) Formulating a strategy to achieve the desired outcomes.
- 4) Implementing and executing the strategy
- 5) Monitoring performance and incorporating feedback mechanisms to initiate corrective adjustments.

### **3. QUALITY FUNCTION DEPLOYMENT**

Quality Function Deployment (QFD) is a methodology to translate customer requirements into the final product or service characteristics. The approach is used for planning products and a services, it is a process starting with the voice of the customer. The methodology was introduced in Japan and was developed at Mitsubishi's Kobe Shipyard in 1972 Sunil Sharma (Hunt and Xavier, 2003). QFD has been widely used successfully to develop new products and services. It has been adapted to different areas such as education, service, software and marketing (Chien and Su, 2003).

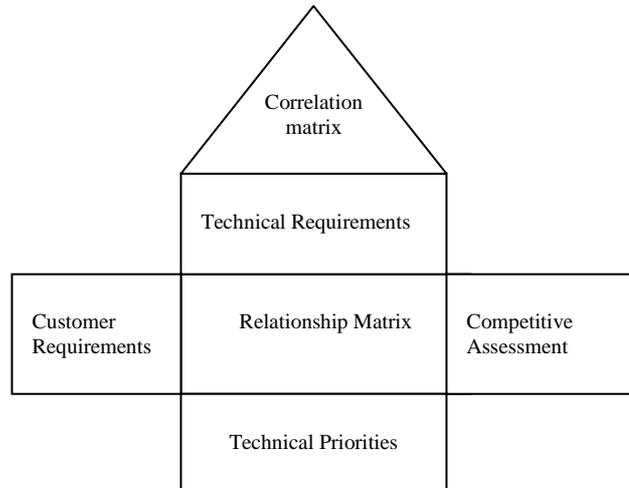
**Figure 1- Strategic Management Process**



Source :Adopted from Hitt et. al (2001):6.

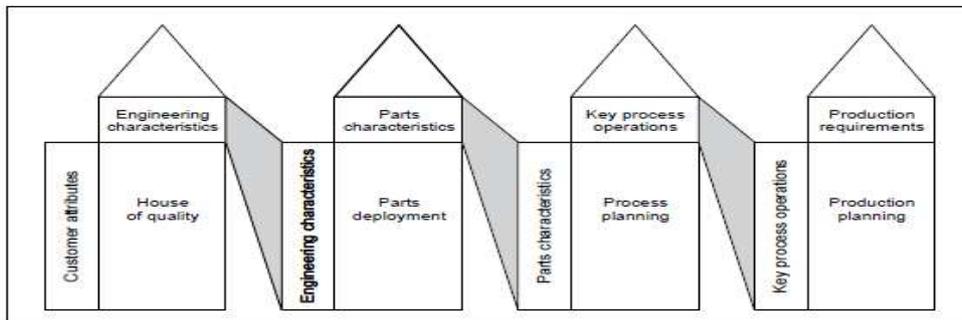
The House of Quality (HOQ) is the first matrix in any QFD process. It translates customer requirements into engineering characteristics to be met by a new product design and helps how an organization will meet those requirements. The matrix displays key customer requirements (whats) and their relationship to technical design requirements (hows). At each stage of deployment, relationships between “what” is required and “how” it will be accomplished are determined mutually by process stakeholders. There are many different forms of the HOQ, but its ability to be adapted to the requirements of a specific problem is significant. The common format of HOQ is made up of six components as shown in Figure 2. These include customer requirements, technical requirements, competitive assessment, relationship matrix, correlation matrix, and technical priorities section respectively.

**Figure 2: The House of Quality**



To trace customer requirements from the initiation of product plan to the most detailed instructions at the operating level, QFD uses a unique structure to allow ‘multifunctional perspectives, interpretation and communication to be fully coordinated along the product-process development cycle’ (Adiona and Roth, 1994).

**Figure 3. The four houses of quality**



Source: Hauser and Clausing (1998)

QFD approach is a step-by-step process. The various steps are: (Jnanesh and Hebbar, 2008)

**Step 1:** Determining the voice of the customer (customer needs) The voice of the customer is required to begin a QFD process, which is often based on experiences with the customer or on a survey report.

**Step 2:** Determining the priority structure of customer needs and preparing the competitive evaluations of customer needs. The customer plays an important role in determining the relative position of the organization with respect to that of its competitors for each customer need. This competitive assessment of customer needs can be accomplished through survey of customers, which includes questionnaire survey, direct interviews, telephone interviews and interaction through e-mail.

**Step-3:** Developing the horizontal portion of the QFD matrix is concerned with the information related to the customer. The list of customer needs, priority rating and competitive assessment of customer needs are occupied with a proper order in this customer portion.

**Step-4:** Developing the Technical(vertical) portion of QFD matrix. Once the customer needs are identified, inter relationships for customer needs and design requirements are established, which are placed at the middle of the technical portion of the QFD matrix. The co-relationship of the design requirements can be examined. The objective is to highlight any requirements that are in conflict with each other. The triangular portion accommodates these co-relations, which gives the overall QFD matrix the appearance of a roof top. As a result, the QFD matrix is referred as the House of Quality. Column weights can be calculated, by using the customers' importance level in conjunction with weights assigned to the relationship symbols. The resultant number provides a method of judging the relative importance of each of the design requirements. These column weights are entered at the bottom of the technical portion of the QFD matrix.

**Step 5:** Analyzing the QFD matrix once it is completed. The team focus should be made on the appropriate design requirements to obtain the complete satisfaction of customer needs in order of final ranking. To fulfill each design requirement, all the necessary steps are analyzed and implemented.

#### **4. QFD IN STRATEGIC PLANNING**

Guinta and Praizler (1993) stated that QFD is an excellent strategic planning tool since it helps decision makers prioritize what is important by providing a logical system to replace emotion-based decision making. The differences between the

use of QFD in strategic planning and product development presented by Crowe and Cheng (1995) are demonstrated in Table 1.

Differences in the strategic planning process come from types of information used, the personnel generally involved and the potential impact of the decision upon the company performances. The stakeholders (employees, shareholders and strategic business partners) will not implement the strategy if they aren't satisfied with it (Hunt and Xavier, 2003).

**Table 1: The differences between product design and strategic planning.**

	<b>Product design</b>	<b>Strategic planning</b>
Input data	Customers' requirements	Corporate and business strategy
Number of translation phases	Four clearly defined phases	Multiple phases
Information nature	Static	Dynamic
Translation data	Easy to define and quantify	Difficult to define and quantify
Evaluation scale	Specific target values for each design attribute	Strategic objectives and goals
Team members	Implementation engineers	Top management and functional level managers
Output	Specific process for manufacturing the product	Manufacturing initiatives, tactical policies and detail task
Project risk	Generally lower	Generally higher

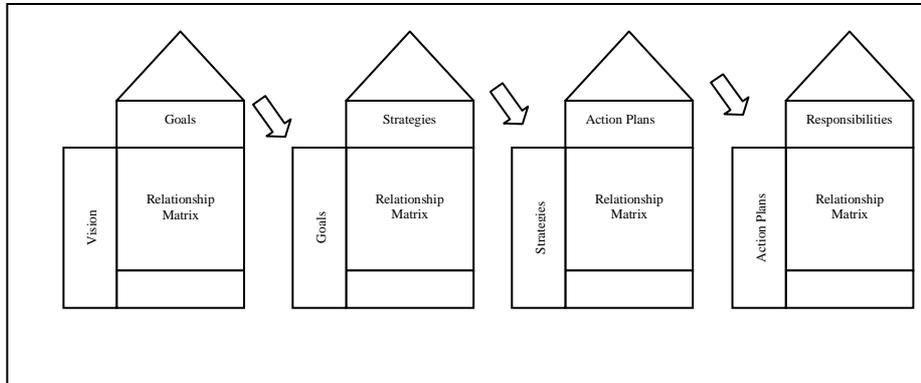
Source: Crowe and Cheng (1995)

The strategic deployment process is given in Figure 4 (Day, 1998). In the first matrix, vision statements are taken into consideration with the importance ratings. The importance scores can be evaluated by a survey in which expectations of customers about company images are measured. Company goals serve to realize vision statements as determined and located in the columns. The strength of the relations between the vision statements and goals are presented in the first relationship matrix. The importance levels of the goals are determined through product planning. The output of the first matrix is the goals with their importance levels. The following matrices give the importance levels of the strategies, action plans and responsibilities respectively (Sofyalıoglu, et al., 2008).

The review of successful applications of QFD in the strategic planning process are given by Hunt and Xavier. They classified these studies according to matrix

components in terms of single and multiple matrix applications. As they stated , the main characteristics of QFD approach in strategic planning are predictive, customer driven, quality in planning, positioning and deployment tools.

**Figure:4 Strategic Deployment Process with QFD**



Source: Adopted from Day (1998)

The benefits of utilizing QFD in strategic planning are summarized as follows (Hunt and Xavier ,2003):

- they develop collaboration between individuals and departments.
- they facilitate the development of a sense of ownership through the involvement of many individuals. This ownership drives the strategy implementation process.
- they are an excellent integrating for the key stages of strategic formulation and implementation.
- they identify customers and their needs with regard to the strategic formulation process.
- They enforce a methodical and comprehensive analysis of all relevant relationships.
- the matrices provide a comprehensive document of all the data used and decisions taken in the strategic decision process.
- emotions and politics are to a large removed from the strategic process.

- the completed matrices can be reused dynamically to allow a rapid refocusing of strategy if circumstances are change.
- they maintain consistency with the firm's capabilities.
- the techniques lead decision –makers through complex decisions and provide a structured view of “fuzzy” issues.

## 5. CONCLUSION

QFD is robust methodology for strategic planning since it is used to extract customer choice factors as input into the traditional HOQ model. Multiple matrices provide the integrity of the customer requirements and corporate interests. It is an iterative process to translate vision into actions by understanding of the customers and stakeholders. This speciality enables organizations to generate innovative strategies.

Current studies show that the advantages of QFD , are not only in product design ,but also in strategic planning. The study explains how one can adapt the traditional QFD to strategic planning. The framework of QFD in strategic planning process can help the practitioners formulate customer-driven strategies and further strategy deployment.

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