

ACHIEVING COMPETITIVE ADVANTAGE: CUSTOMER'S OPINION AND VALUES ABOUT LOGISTICS SERVICES

Dr.A.R.Nithya, Guest Faculty, DoMS, Madurai Kamaraj University,

Mr. A.G.Balasubramanian, Student, DoMS, Madurai Kamaraj University.

Abstract

Purpose – The purpose of this paper is to analyse the customer's views, expectations and ways of fulfilling them through supply chain management (SCM) practices

Design/methodology/approach – Qualitative research adopting descriptive research design. Some major SCM practices were extracted, These identified practices are then compared to explore the relationship between them for better understanding and application.

Findings – strategies to improve customer service levels and, hence, business performance.

Research limitations/implications – This paper focuses about application of QFD strategic technique on SCM, empirical study undertaken for identifying the same.

Practical implications – The result of this paper will help in providing greater understanding of identified SCM practices that will lead to successful implementation of QFD on SCM

Originality/value – Literature work carried on SCM practices and QFD process. Empirical study carried out to convey the established relationship between QFD and enhancing SCM practices.

Keywords Total quality management, Supply chain management, Quality functional deployment

Paper type Empirical research review

INTRODUCTION

Total quality management (TQM) and supply chain management (SCM) have been identified as the two most important strategies for manufacturing, services and small-to-medium size enterprises (SMEs); and have become a prerequisite for success in the global market. Competitive advantage is the greatest tool for market survival. TQM and SCM act as important tools to achieve competitive advantage together with strengthening organizational competitiveness (Sila et al., 2006; Vanichchinchai and Igel, 2009). TQM is an integrated approach, consisting of principles and practices, whose goal is to improve the quality of an organization's goods and services through continuously

meeting and exceeding customer's needs in most competitive ways. TQM focuses on enhancing customer satisfaction (Gunasekaran and McGaughey, 2003). On the other hand, SCM is seen as an approach to improve competitive performance by integrating the internal functions of an organization and linking these with the external operations of suppliers, customers and other members of the supply chain. This may lead to changes in the traditional structure of the organization (Tutuncu and Kucukusta, 2008). SCM focuses on coordination and configuration of the processes that are necessary to make products ontime (no delay), reproducibly, and in a satisfactory condition (quality assurance) together with handling procurement of the material/service inputs (Foraker et al., 1997). In addition to the above, TQM is a total system approach which works horizontally across functions and departments, involving all employees, top to bottom, and extends backwards and forwards to include the supply chain and customer chain. SCM takes a vertical view of the relationship between the buyer and supplier, focusing on the performance of upstream and downstream organizations (Kanji and Wong, 1999). Both upstream and downstream organizations have to be managed directly or indirectly by companies in order to satisfy their customers.

COMPETITIVE ADVANTAGE MEANS OF MARKET SURVIVAL:

Marketing analysts and experts will definitely agree about satisfying customer's value and expectations will yield in greatest competitive advantage. Henceforth it is the main aim of any companies developing superior customer value through by enrichen product service and benefits.

Indeed, creating superior customer value is a necessary condition for a company securing a niche in a competitive environment, not to mention a leadership position in the market (Day 1990). According to Porter lawler's model (1980) any company can achieve competitive advantage by strengthening the two generic routes i.e., cost reduction and product differentiation. In this research we have adopted the same route given by porter model, here product/ service differentiation can be achieved by enhancing the quality of the service by valuing the customer's expectations about the service. Quality can be defined as Performance/ Expectations. If the customer's expectations are fulfilled to higher level functionality quality can be achieved. Day (1990) addresses the issues in analyzing customer value and proposes that it can be expressed in a "value equation": "Customer's Perceived Benefits-Customer's Perceived Costs=Perceived Customer Value" (p. 142). One among the tools of TQM is quality function deployment, Quality function deployment (QFD) is becoming a widely used customer-oriented approach and tool in product design.

REVIEWS OF LITERATURE

As Kordupleski, Rust, and Zahorik (1993, p. 83), point out, however, "without marketing's involvement, how can the organization be sure that its internal improvements are relevant to the customer?" As Garvin and March (1989) says that, As management is responsible for most quality problems, management

must take the lead in changing the systems and processes that create those problem. The QFD approach embraces the marketing concept by translating and diffusing customer needs - the voice of the customer - vertically and horizontally throughout the organization. Consequently, all company efforts are aimed at generating customer satisfaction as the key to achieving organizational goals (Kotier 1991). QFD methodology is accomplished with cross-functional teams using a series of houses (or charts) to deploy critical customer demands or wants systematically throughout four phases of product development - product planning, parts deployment, process planning, and production planning (Conway 1992, Denton 1990). QFD suggests a logical involvement of marketing as either the lead function or as part of a team in the various stages of deployment (O'Neal and LaFief 1992). The house of quality begins with the customer, whose requirements are called "product attributes" - phrases customers use to describe product and service characteristics (Hauser and Clausing 1988). A customer can be either external, the buyer of the firm's products and services, or internal, the company's employee (Mohr-Jackson 1991). AkaO and YOJI (1990) Quality Function Deployment: Integrating Customer Requirements into Production Design, Productivity. To utilize its power during the product design stage so that the product design characteristics could be converted into precise quality control points in the manufacturing quality control chart (Hill, 1994). A quality table that showed the correlation between the customer-required quality functions and the counterpart engineering characteristics (Hill, 1994). The first recorded case study in QFD in the US was probably in 1986 when Kelsey Hayes used QFD to develop a coolant sensor, which fulfilled critical customer needs such as "easy-to-add coolant", "easy-to-identify unit", and "provide cap removal instructions" (King, 1987a; Prasad, 1998a). QFD has been successfully used in many Japanese industries, such as agriculture systems, construction equipment, consumer electronics, home appliances, integrated circuits, software systems, steel, synthetic rubber, and textile (Akao, 1990a; Hauser and Clausing, 1988; Kim and Moskowitz, 1997). One of QFDs two popular application fields is product development and process development (Ansari and Modarress, 1994; Anthony and Dirik, 1995). Quality management and product development are achieved in QFD through customer needs analysis (Bech, 1997; Bergquist and Abeysekera, 1996; Bhote, 1997a; Brown, 1991b). There are also QFD applications addressing some specific aspects of customer needs analysis, such as customer involvement (Huovila and Seren, 1998; Kaulio, 1998; Tottie and Lager, 1995), customer preference (Lai, 1998), customer responsiveness (Atkinson, 1990), customer services (Denton, 1990a). QFD can be referred to as designed-in quality rather than traditional inspected-in quality in the sense that it helps a company shift from inspecting the products quality to designing quality into the product through customer needs analysis (Guinta and Praizler, 1993). QFD is a pro-active "customer-driven planning process" so that problems could be found and solved at the very beginning of the product development and fewer people have to deal with the problems at the later stages (Day, 1993) This idea of QFD is not only applicable to the usual product planning (Cohen, 1988; Ngai and Chow, 1999).

Objectives

1. To ascertain the customer's expectations about quality of logistics service.
2. To enhance quality of service through QFD process
3. To provide suitable suggestion to the company based on QFD

Key Logistics Activities

Outlined below are the key activities required to facilitate the flow of a product from point of origin to point of consumption. All of these activities, listed below, may be considered part of the overall logistics process.

1. Customer service
2. Demand forecasting / planning
3. Inventory management
4. Logistics communication
5. Material handling
6. Order processing
7. Plant and warehouse site selection
8. Procurement
9. Return goods handling
10. Warehousing and storage

While all organization may not explicitly consider these activities to be part of logistics activities, each activity affects the logistics process.

Quality Function Deployment:

The average consumer today has a multitude of options available to select from for similar products and services. Most consumers make their selection based upon a general perception of quality or value. Consumers typically want “the most bang for their buck”. In order to remain competitive, organizations must determine what is driving the consumer's perception of value or quality in a product or service. They must define which characteristics of the products such as reliability, styling or performance form the customer's perception of quality and value. Many successful organizations gather and integrate the **Voice of the Customer (VOC)** into the design and manufacture of their products. They actively design quality and customer perceived value into their products and services. These companies are utilizing a structured process to define their customer's wants and needs and transforming them into specific product designs and process plans to produce products that satisfy the customer's needs. The process or tool they are using is called Quality Function Deployment (QFD).

MEANING AND DEFINITION OF QFD:

Quality Function Deployment (QFD) is a process and set of tools used to effectively define customer requirements and convert them into detailed engineering specifications and plans to produce the products that fulfill those requirements. QFD is used to translate customer requirements (or VOC) into measurable design targets and drive them from the assembly level down through the sub-assembly, component and production process levels. QFD methodology provides a defined set of matrices utilized to facilitate this progression.

IMPLEMENTATION OF QFD IN LOGISTICS SECTOR:

Effective communication is one of the most important and impactful aspects of any organization's success. QFD methodology effectively communicates customer needs to multiple business operations throughout the organization including design, quality, manufacturing, production, marketing and sales. This effective communication of the Voice of the Customer allows the entire organization to work together and produce products with high levels of customer perceived value. There are several additional benefits to using Quality Function Deployment:

- **Customer Focused:** QFD methodology places the emphasis on the wants and needs of the customer, not on what the company may believe the customer wants. The Voice of the Customer is translated into technical design specifications. During the QFD process, design specifications are driven down from machine level to system, sub-system and component level requirements. Finally, the design specifications are controlled throughout the production and assembly processes to assure the customer needs are met.
- **VOC Competitor Analysis:** The QFD "House of Quality" tool allows for direct comparison of how your design or product stacks up to the competition in meeting the VOC. This quick analysis can be beneficial in making design decisions that could place you ahead of the pack.
- **Shorter Development Time and Lower Cost:** QFD reduces the likelihood of late design changes by focusing on product features and improvements based on customer requirements. Effective QFD methodology prevents valuable project time and resources from being wasted on development of non-value added features or functions.
- **Structure and Documentation:** QFD provides a structured method and tools for recording decisions made and lessons learned during the product development process. This knowledge base can serve as a historical record that can be utilized to aid future projects.

Companies must bring new and improved products to market that meet the customer's actual wants and needs while reducing development time. QFD methodology is for organizations committed to listening to the Voice of the Customer and meeting their needs.

PROCESS OF QFD:

The Quality Function Deployment methodology is a 4-phase process that encompasses activities throughout the product development cycle. A series of matrices are utilized at each phase to translate

the Voice of the Customer to design requirements for each system, sub-system and component. The four phases of QFD are:

1. **Product Definition:** The Product Definition Phase begins with collection of VOC and translating the customer wants and needs into product specifications. It may also involve a competitive analysis to evaluate how effectively the competitor's product fulfills the customer wants and needs. The initial design concept is based on the particular product performance requirements and specifications.
2. **Product Development:** During the Product Development Phase, the critical parts and assemblies are identified. The critical product characteristics are cascaded down and translated to critical or key part and assembly characteristics or specifications. The functional requirements or specifications are then defined for each functional level.
3. **Process Development:** During the Process Development Phase, the manufacturing and assembly processes are designed based on product and component specifications. The process flow is developed and the critical process characteristics are identified.
4. **Process Quality Control:** Prior to production launch, the QFD process identifies critical part and process characteristics. Process parameters are determined and appropriate process controls are developed and implemented. In addition, any inspection and test specifications are developed. Full production begins upon completion of process capability studies during the pilot build.

Effective use of QFD requires team participation and discipline inherent in the practice of QFD, which has proven to be an excellent team-building experience.

Level 1 QFD

The House of Quality is an effective tool used to translate the customer wants and needs into product or service design characteristics utilizing a relationship matrix. It is usually the first matrix used in the QFD process. The House of Quality demonstrates the relationship between the customer wants or "Whats" and the design parameters or "Hows". The matrix is data intensive and allows the team to capture a large amount of information in one place. The matrix earned the name "House of Quality" due to its structure resembling that of a house. A cross-functional team possessing thorough knowledge of the product, the Voice of the Customer and the company's capabilities, should complete the matrix. The different sections of the matrix and a brief description of each are listed below:

- **"Whats":** This is usually the first section to be completed. This column is where the VOC, or the wants and needs, of the customer are listed.
- **Importance Factor:** The team should rate each of the functions based on their level of importance to the customer. In many cases, a scale of 1 to 5 is used with 5 representing the highest level of importance.
- **"Hows" or Ceiling:** Contains the design features and technical requirements the product will need to align with the VOC.
- **Body or Main Room:** Within the main body or room of the house of quality the "Hows" are ranked according to their correlation or effectiveness of fulfilling each of the "Whats". The ranking system used is a set of symbols indicating either a strong, moderate or a weak correlation. A blank box would represent

no correlation or influence on meeting the “What”, or customer requirement. Each of the symbols represents a numerical value of 0, 1, 3 or 9.

- **Roof:** This matrix is used to indicate how the design requirements interact with each other. The interrelationships are ratings that range from a strong positive interaction (++) to a strong negative interaction (–) with a blank box indicating no interrelationship.
- **Competitor Comparison:** This section visualizes a comparison of the competitor’s product in regards to fulfilling the “Whats”. In many cases, a scale of 1 to 5 is used for the ranking, with 5 representing the highest level of customer satisfaction. This section should be completed using direct feedback from customer surveys or other means of data collection.
- **Relative Importance:** This section contains the results of calculating the total of the sums of each column when multiplied by the importance factor. The numerical values are represented as discrete numbers or percentages of the total. The data is useful for ranking each of the “Hows” and determining where to allocate the most resources.
- **Lower Level / Foundation:** This section lists more specific target values for technical specifications relating to the “Hows” used to satisfy VOC.

Upon completion of the House of Quality, the technical requirements derived from the VOC can then be deployed to the appropriate teams within the organization and populated into the Level 2 QFDs for more detailed analysis. This is the first step in driving the VOC throughout the product or process design process.

Level 2 QFD

The Level 2 QFD matrix is used during the Design Development Phase. Using the Level 2 QFD, the team can discover which of the assemblies, systems, sub-systems and components have the most impact on meeting the product design requirements and identify key design characteristics. The information produced from performing a Level 2 QFD is often used as a direct input to the **Design Failure Mode and Effects Analysis (DFMEA)** process. Level 2 QFDs may be developed at the following levels:

- **System Level:** The technical specifications and functional requirements or “Hows” identified and prioritized within The House of Quality become the “Whats” for the system level QFD. They are then evaluated according to which of the systems or assemblies they impact. Any systems deemed critical would then progress to a sub-system QFD.
- **Sub-system Level:** The requirements cascaded down from the system level are re-defined to align with how the sub-system contributes to the system meeting its functional requirements. This information then becomes the “Whats” for the QFD and the components and other possible “Hows” are listed and ranked to determine the critical components. The components deemed critical would then require progression to a component level QFD.
- **Component Level:** The component level QFD is extremely helpful in identifying the key and critical characteristics or features that can be detailed on the drawings. The key or critical characteristics then flow down into the Level 3 QFD activities for use in designing the process. For purchased components, this information is valuable for communicating key and critical characteristics to suppliers during sourcing negotiations and as an input to the **Production Part Approval Process (PPAP)** submission.

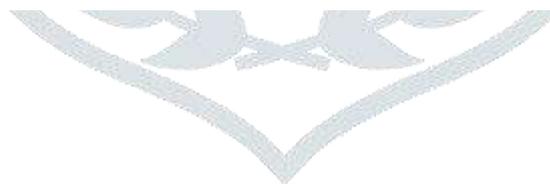
Level 3 QFD

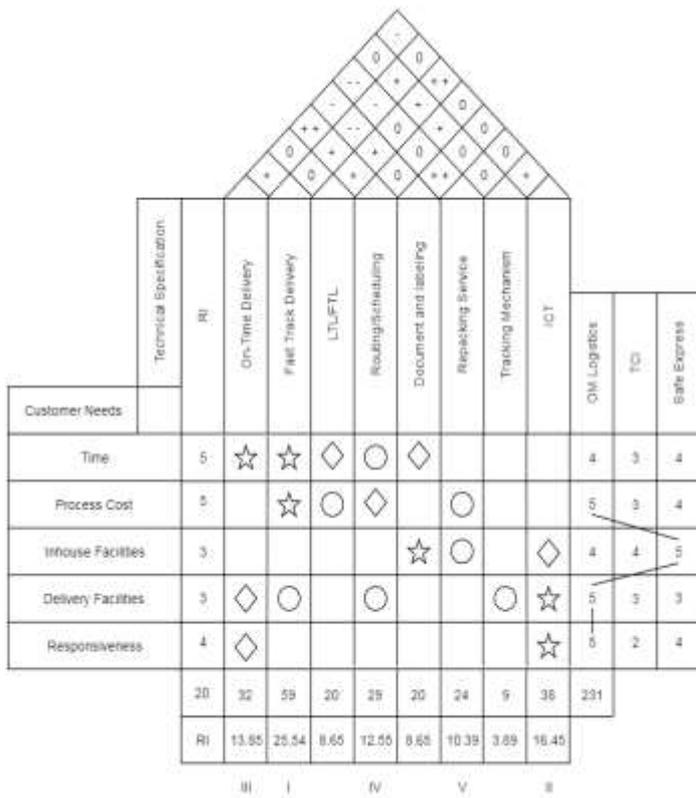
The Level 3 QFD is used during the Process Development Phase where we examine which of the processes or process steps have any correlation to meeting the component or part specifications. In the Level 3 QFD matrix, the “Whats” are the component part technical specifications and the “Hows” are the manufacturing processes or process steps involved in producing the part. The matrix highlights which of the processes or process steps have the most impact on meeting the part specifications. This information allows the production and quality teams to focus on the Critical to Quality (CTQ) processes, which flow down into the Level 4 QFD for further examination.

Level 4 QFD

The Level 4 QFD is not utilized as often as the previous three. Within the Level 4 QFD matrix, the team should list all the critical processes or process characteristics in the “Whats” column on the left and then determine the “Hows” for assuring quality parts are produced and list them across the top of the matrix. Through ranking of the interactions of the “Whats” and the “Hows”, the team can determine which controls could be most useful and develop quality targets for each. This information may also be used for creating Work Instructions, Inspection Sheets or as an input to **Control Plans**.

The purpose of Quality Function Deployment is not to replace an organization’s existing design process but rather support and improve an organization’s design process. QFD methodology is a systemic, proven means of embedding the Voice of the Customer into both the design and production process. QFD is a method of ensuring customer requirements are accurately translated into relevant technical specifications from product definition to product design, process development and implementation. The fact is that every business, organization and industry has customers. Meeting the customer’s needs is critical to success. Implementing QFD methodology can enable you to drive the voice of your customers throughout your processes to increase your ability to satisfy or even excite your customers.





++	Strong Positive	+5
+	Positive	+3
0	No Correlation	0
-	Negative	-3
--	Strong Negative	-5

☆	Strong	+5
○	Medium	+3
◇	Weak	+1

From the above analysis, it is found that the most expected one from the customer is fast truck delivery that is the most one they are expecting it affects the quality because the relative value for the fast of delivery is 25.54 with the overall quality score of 231. So 25%, it affects the quality level of the organization of their service. While Comparing with the market or comparative assessment index, my company is not showing so good in for maintaining the time expectations from the customer because the customer scores only above 4. So what is the thing I have to focus for fast truck delivery is for improving the fast truck delivery I have to focus on engineering metrics how come the fast of delivery is correlate with the rest of the activities and the next two ranking is given for ICT tools. ICT tools, my company is doing well in the market while comparing with the competitors and the next level is on-time delivery. On-time delivery how I am doing is that is also good so I have to focus about the customer's expectation on time I have to focus much more comparing with the rest of the expectations of the customer.

FINDINGS:

. From the House of Quality (HOQ) Diagram analysis, I concluded that the customer needs are satisfied through fast track delivery, ICT (Information and Communication Tools), On-Time Delivery.

1. Through the comparative assessment index, I found that OM Logistics are good in their service regarding cost, delivery facilities, responsiveness.

2. While comparing with competitors, OM Logistics are lack in their Inhouse facilities.

SUGGESTIONS:

There by using many statistical tools to analysis the data various fruitful suggestions had been extracted from the study. The following ideas and concern may be taken as the suggestion for the improvement overall Logistics operation process.

1. Delayed deliveries are mostly due to Routing/Scheduling so the company has to concentrate more focus on routing/ scheduling to reduce delayed deliveries.

2. The company have to improve their equipments and manpower for an effective warehouse working process.

3. Need to become little quick and fast in stuffing and de-stuffing of goods in the truck.

4. Instead of searching consignments through invoice, it is better to identifying the consignments through racks. So, the company has to increase the racks facilities for all types of goods. It saves the time and availability of space.

CONCLUSION:

Logistics service industries are offering high quality service to their customers. They can have better experience in service market through which the company can offer the best service to the customer. The company has made sincere efforts to achieve its goals and objectives over the years. It has good service record and good market potential image. This study gives the overview of the SCM and QFD services. It also explores various types of service provided by logistics industry and quality function deployment (QFD) Diagram represent the service provided by the company. Logistics sector is building long lasting relationships with the customers. Every member of logistics company is motivated to perform and deliver to the fullest of their ability by constantly upgrading the skill-set of employees to suit long-term goals. Through this the company expects to come out with highly competitive and technologically advanced service and solutions.

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