

EFFECTS OF TOTAL QUALITY MANAGEMENT IMPLEMENTATION ON SUPPLY CHAIN PERFORMANCE IN THE LOGISTICS SERVICE PROVIDERS IN KENYA: A CASE OF DHL

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ABSTRACT

In trying to gain competitive advantage, supply chain players try to outshine their competitors by providing quality services that meets or exceeds the expectation of customers. Thus, customer satisfaction in this industry is never ending as they face numerous challenges and competition daily. This makes Quality management critical to this sector as they strive to continuously improve their services to meet customers' expectation. The overall objective of this study was to examine the effects of implementation of Total Quality Management on Supply Chain Performance in Logistics Service providers in Kenya, citing DHL - Kenya. A descriptive research design was used in this study. The study targeted employees of DHL Kenya. Primary data was collected using a questionnaire from the employees of DHL in Nairobi Kenya. From the findings of this study, employee training was found to be fundamental aspect that shapes the workers skills by offering them with the relevant competences which are vital recipes that facilitate total quality management. The study found out that resource integration gives unified data integrity that provides reach information required in developing compliance and supply chain management practices at DHL thus reducing operation costs. The study found out that top management support affects the supply chain performance to a great extent and that that Information Technology investment makes contribution to supply chain performance. As the study suggested, it is recommended that DHL should invest more on new technologies to save costs, to improve customer service and supplier relationships, business processes and performance, and to open new business opportunities.

Key Words: *competitive advantage, customer satisfaction, Total Quality Management, supply chain management, employee training, Information Technology and performance*

Introduction

Total Quality Management (TQM) is a management philosophy which focuses on the work process and people, with the major concern for satisfying customers and improving the organizational performance (Johnson & Omachonu, 2005). It involves the proper coordination of work processes which allows for continuous improvement in all business units with the aim of meeting or surpassing customer's expectations. It emphasizes on totality of quality in all facets of an organization with the aim of reducing waste and rework to reduce cost and increase efficiency in production. TQM is applicable to any organization irrespective of size, and motives, even the public sector organization are fast adopting the ideology in order to make them effective in meeting public demands. However, the adoption of the ideology by most organization has been hampered due to their non-compliance with the procedures and principles of TQM implementation. While some organization, run TQM like a program which they expect to function and perform the magical by itself, others have used a halfhearted approach to it, by using some bits and pieces of the principles. This has accounted for the failure of most organization in meeting up to their expected target from implementing this ideology. According to (Martinez et al, 2009), there is a need to continue to buttress the benefits that accrue to organizations from the implementation of TQM, especially in developing economies, such as Kenya where the adoption of these principles seems far-fetched to organizations.

Supply Chain is all about managing the "flow" of materials and information among the respective stakeholders. Key elements of the above are people and processes. (Trent, 2001). In fact, Supply Chain Management is all about managing people and processes to ensure fulfillment of customer needs and desires. Whether it is procurement, production planning, inventory management, distribution, warehousing, waste management or logistics including (reverse), it is absolutely imperative that people and process focus help achieve customer results. (Zhang et al, 2006). While going through various literature on integration of TQM and SCM, one of the SCM Excellence Models developed by Gopal Kanji and Alfred Wong indicates the extent of TQM principles such as customer focus / goals, people based management / people involvement, factual management or data based management and culture of continuous improvement all of this driven by leadership resulting in business excellence in SCM processes (Stanley & Wisner, 2001). The implementation of total quality management techniques enables organizations to improve internal efficiencies, which is considered as a pre requisite to become competitive in global marketplace (Lambert, 2008). Quality management practices have been built on the concept of total quality management which has become a world-wide topic in the twenty-first century guiding quality management practices in organizations. Having its roots partly in the USA and partly in Japan, it was primarily adopted by some Japanese companies in the decades immediately after World WarII. With the greater successes of Japanese companies during the 1980s, companies all over the world found that it was necessary to have good quality management practices in order to stay competitive (Xu et al , 2002).

In Africa most countries have adopted quality management practices in both manufacturing and service sectors but differences occur in the manner in which TQM is applied. (Sotunde, 1990), assess the application of TQM in USA, Switzerland and South Africa to investigate the relationship between national culture and the implementation of TQM. Their results show that in each country, several distinct relationships between the dimensions of TQM implementation and national culture exist. They therefore imply that the application of TQM should take into account different characteristics of national cultures.

In Kenya quality management practices have been widely adopted in both the private and public sector by the official certifying body Kenya Bureau of Standards (KEBS) among other international certifying bodies. KEBS was established in July 1974 to provide Standardization and Conformity Assessment services that consistently meet its customer's requirements. KEBS provides the necessary resources towards the effective implementation and continual improvement of the Quality Management System that complies with ISO9001:2008. (ISO, 2004). The Kenya Bureau of Standards Certification Body (KEBS) is one of the leading Certification bodies in the East and Central African Region. It is an organization established by an Act of parliament, The Standards Act, Cap496 of the laws of Kenya in 1974. It started its certification operations in August 2002 and since then; it has been in the fore front in certification on different quality management systems in Kenya as well as ensuring continuous improvement of QMS in certified organizations through periodical audits and re-certification.

A large number of organizations both large and small in the Supply chain sector suffer from lack of information in the field of quality management and they need theoretical and practical training in this field (G.o.K, 2006). Based on the fact that agriculture and food industry sector is the largest contributor of the Kenyan GDP, 26% of GDP in 2008 (G.o.K, 2006), governmental policies in Kenya should strive towards the implementation of quality management approaches in pursuit of acquiring quality service excellence in this sector.

Problem Statement

Even as organizations strive to meet customer's expectation, there still exist some flaws in the process involved in service delivery (Chopra & Meindl, 2006). Most supply chain firms are now narrowing down their quality approach to few operations rather than in cooperating wholly in all their entire supply chain processes in order to cut cost. This on the contrary has resulted to loss of sales approximated to over 20 billion dollars globally (McCabe & Wilkinson, 2009). The emergence of various supply chain service players into the market is now changing the face of competition in the service industry, as the upcoming service providers tend to adopt a total quality management ideology (Smith, 2004). The improvement in quality has resulted in 1% increased market share and profitability of many organizations. To achieve vision 2030 in Kenya, firms are tasked to adopt TQM philosophy so as to change how they perform

their activities to eliminate inefficiency, enhance customer satisfaction and improve GDP to 2% locally (G.o.K, 2010).

Despite the above cited benefits, supply chain players have been somewhat slow in adopting quality initiatives, not only due to excessive managerial involvement in day-to-day entrepreneurial activities that typically focus on sales strategies and market growth but also because they have not embraced the formal approaches that have been advocated as part of ISO9000 series registration, and introduction of quality initiatives like TQM (Daleet al, 2004). Despite its conceptual rigor, the role of quality is affecting organizational growth (David, 2009). A research by (McCabe & Wilkinson, 2009) shows that most Supply chain firms lose between 5%-15% of sales revenue as a result of the lack of full attention to quality. This suggests that formal quality management systems are important tools contributing to the growth and development of Supply chain performance. This study aims to address the gap in research on the implementation of total quality initiatives and its effect on supply chain performance in Kenya. In order to bridge the gap and provide Supply chain firms with practical assistance in dealing with this issue, this research cited DHL which is one of the leading logistics firms in Kenya to examine whether adoption of total quality management inevitably contributes towards the supply chain efficiency and effectiveness.

Literature Review

According to (Cooper & Ellram, 2003), TQM can minimize the total cost of supply chain through 'sourcing'. The cost in this case is reduced by limiting the number of suppliers used by the firm and providing them with necessary training and technology. The efficient functioning of an operation will then depend on how well the suppliers meet up with the expectations of the organization. This is why the TQM principle emphasizes the totality of quality in all facets which includes the suppliers. TQM endorses the total quality approach in creating customer satisfaction. (Zhang et al, 2006).

The total quality approach creates an integrated method of analyzing operation by focusing the processes of production on customer satisfaction. Thus, it requires that quality be built into all the supply chain processes so as to be efficient in the overall operation (Ahmadi & Helms, 2005). (Kaynak, 2003), suggested that the effectiveness of TQM organizations should be measured by the degree of integration with their supplier bases because supplier quality management is a critical component of TQM. Operational effectiveness is then a function of how well the various units of an organization carry out their functions with quality.

Adoption of IT will help an organization to develop both efficiency and effectiveness measures for "performance management" of the processes. Some cited examples include reduction in time from purchase requisition to purchase ordering, items received on time with zero quality defects could be another efficiency measure that improves customer service (Stanley & Wisner, 2001).

Information technology helps to develop quality process based reviews for process improvements that reduce process variability and aim for "zero defect". Information Technology facilitates resource integration and decision making through cross functional teams that improve efficiency and effectiveness (Ma & Tang, 2001).

Advanced systems lead to quality improvements in the design stage because errors are discovered earlier in the process and more quickly. The sufficient and adequate data and information is the foundation of making right and effective decisions. Up to now, many enterprises have begun to collect and deal with all kinds of data and information by utilizing many advanced information technology, such as JIT, EDI, MRP1, MRP11, ERP, POS, Intranet/Extranet/Internet, so as to provide foundation for making effective decision (Ma et al, 2000).

Top management support and commitment is very important for the successful implementation of quality management practices in an organization. According to (Ghobadian et al, 2004) quality is viewed as ultimately and inescapably the responsibility of top management because top management create the organizations systems that determine how products and services are produced, the quality improvement process must begin with management's own commitment to TQM. (Juran, & Gryna, 2008) also observed that top management must communicate TQM to the entire organization to create awareness, interest, desire and action.

Additionally top management should generate enthusiasm for TQM activities in enforcing code of conduct, providing opportunities to subordinates to grow in their area of work, delegating authority to subordinates to make them more responsible, incorporating TQM programmes in the organizations overall strategy, reorganize employees for quality achievements and demonstrating by both words and actions that quality is number one operating priority of the organization (Porter & Tanner, 1996).

Supply chain Performance

A supply chain is a network of connected and independent organizations mutually and cooperatively working together to control manage and improve the flow of materials and information from suppliers to end users,(Dale &Cooper, 2003).Supply Chain is all about managing the "flow" of materials and information among the respective stakeholders. Key elements of the above are people and processes. In-fact, Supply Chain Management (SCM) is all about managing people and processes to ensure fulfillment of customer needs and desires (Lambert, 2008).

Whether it is procurement, production planning, inventory management, distribution, warehousing, waste management or logistics including (reverse), it is absolutely imperative that people and process focus may to help achieve customer results. Thus, if SCM is all about people

and processes, there cannot be any better improvement model than TQM which focuses on people and processes. The integration of TQM principles with SCM would be a significant enabler for sigma level improvements in SCM performance (Trent, 2001).

Incorporating SCM successfully leads to a new kind of competition on the global market, where competition is no longer of the company-versus-company form but rather takes on a supply-chain-versus-supply-chain form. The primary objective of SCM is therefore to fulfill customer demands through the most efficient use of resources, including distribution capacity, inventory, and labor. In theory, a supply chain seeks to match demand with supply and do so with the minimal inventory (Trent, 2001).

Various aspects of optimizing the supply chain include liaising with suppliers to eliminate bottlenecks; sourcing strategically to strike a balance between lowest material cost and transportation, implementing just-in-time techniques to optimize manufacturing flow; maintaining the right mix and location of factories and warehouses to serve customer markets; and using location allocation, vehicle routing analysis, dynamic programming, and traditional logistics optimization to maximize the efficiency of distribution (Gaucher & Coffey, 2003).

The Empirical Review

According to (Mohammed, 2006), TQM is an effective system for integrating the quality development, quality maintenance and quality improvement efforts of various aspects of a system so as to enable services at most economical level and derive full satisfaction. TQM is aimed at the satisfaction of customers' needs in an efficient, reliable and profitable way. It involves a radical direction through which an organization perform her day to day operations in other to ensure that quality is put at the top of mind of every employee and departments in which they operate. (Subonteng et al, 2006), defined TQM as the synthesis of the organizational, technical and cultural elements of a company. They opined that TQM is a heart and mind philosophy which recognizes that company culture affects behavior which in turn affects quality.

(Oakland, 2003), describes TQM as an approach to improve competitiveness efficiently and flexibility for the whole organization. According to (Seibert et al, 2004), TQM can be defined as a management system which consist of inter dependent unit namely core values, techniques such as process management, benchmarking customer focused planning or improvement teams and tools such as control charts. (Dimitrades, 2000), saw TQM as a corporate culture that is characterized by increased customer satisfaction through continuous improvement involving all employees in the organization. (Oakland, 2003), noted that 'for an organization to be truly effective each part of it must work properly together towards the same goal, recognizing that each person and each activity affects and in turn is affected by each other—the methods and techniques used in TQM can be applied throughout any organization.'

ISO quality management system emphasizes the process approach which requires understanding and meeting requirements, the need to consider processes in terms of added value.(ISO 2004) Additionally it emphasizes obtaining of results of process performance, effectiveness as well as continual improvement of processes based on objective measurement. Requirements for a quality management system, ISO require an organization to demonstrate ability to consistently provide product that meets customer and applicable statutory and regulatory requirements. Additionally this aims to enhance customer satisfaction through effective application of the system including processes for continual improvement of the system and the assurance of conformity to customer and applicable statutory requirements. (International organization of standardization 2008)

Despite the extent of documented studies on implementation of total quality management there is a gap in evaluation and assessment of the influence it has on organizational supply chain performance with respect to efficiency. (Kennedy & Brian, 2006) analysis the benefits of electronic-procurement to create a competitive advantage while (Masters, 2006) emphasizes on the use of ICT to reduce labor and inventory cost. There is no direct analysis of how the aspects of cost and training influence the supply chain performance.

Many scholars have investigated total quality management through case studies, success histories, theoretical researches, and extensive empirical research. For instance,(O'Brien. & Voss, 1992) analyzes the management quality control methods for record accuracy. Nevertheless, limited attention has been paid to the role of quality information systems in supporting modern total quality management practices to obtain high quality performance. This affects the supply chain performance of the organization at large and thus the need to undertake the study.

This proposal attempts to fill this gap by examining the effects of implementation of Total Quality Management on Supply Chain Performance in Kenya with specific reference to DHL. In reality many organizations and industries worldwide have not adopted measures to control and manage supply chain practices. This is due to unawareness of the benefits which come with it. This has made the study to be carried out to come up with solutions that will assist in embracing this strategy in organizations.(Oakland 2003) According to the literature available, the study has been carried out globally and now the study intends to look at the effect of total quality management on supply chain performance in Kenya, in the private sector as an area that has not been fully addressed previously.

Research Methodology

A descriptive research design was used in this study. The study targeted 500 employees of DHL in Nairobi. A proportionate sample size of approximate 50 respondents which is 10% of the population was selected using a simple stratified random sampling technique from the identified sample. The researcher collected both primary and secondary data during the researcher. Primary

data was collected using a questionnaire from the employees of DHL in Nairobi Kenya. The questionnaire contained both structured and unstructured questions. Quantitative data from the questionnaire was analyzed by employing descriptive statistics and inferential analysis using statistical package for social science (SPSS). Supply Chain Performance was regressed against four variables of intellectual capital namely (Employee Training, Top Management Support, Information Technology and Cost Reduction).

Research Findings

The study found out that majority of the employees at 63% believed that training was a fundamental aspect which shapes the workers skills and offering them competences which are vital recipes that facilitate total quality management in logistics service provision. This is supported by a study by Deming, (1988).who suggested that education and training are fundamentals for the successful implementation of TQM; he continued to say that TQM requires employee's participation; each employee needs to learn and understand the underlying principles of TQM. The study found out that resource integration gives a unified data integrity that provides reach information required to develop compliance and supply chain management practices at DHL thus reducing operation costs. This is supported by a mean of 3.7 from the respondent's findings.

The study also noted that cost management, top management support, adequate technology solutions, strategic partnering and skilled personnel are some of the key factors that work towards enhancing supply chain efficiencies and effectiveness that are derived from TQM implementation. This was shown by a mean of 4.3 from the findings. This statement was echoed by Cooper & Ellram (2003), who pointed that, TQM can minimize the total cost of supply chain through activity integration e.g e-sourcing. The cost in this case is reduced by limiting the number of suppliers used by the firm and providing them with necessary training and skills required to deal with the emerging issues of supply chain dynamics.

As the study sought to find out whether Information Technology has any effect in the implementation of total quality management in enhancing supply chain performance, the results from the respondents indicated that IT, affects supply chain performance to a very great extent; that Information Technology investment makes contribution to supply chain performance as shown by a mean of 3.9; that new technologies are promising to save costs, to improve customer and supplier relationships, business processes and performance, and to open new business opportunities as shown by a mean of 3.9; and that technologies allow organizations to respond better to existing challenges that improve the anticipation of future developments as shown by a mean of 3.6. The adoption of information technology can be considered as strategic in so far as these technologies can impact value chains and industries structures and can in particular create value from intangibles in business activities (Kauffman, 2006).

The study found out that top management support affects the supply chain performance to a great extent; that top management are committed to staff development and career enhancement as shown by a mean of 4.7; top management train employees on the use of quality statistical tools as shown by a mean of 4.1; that top management encourage collaborative relationships with suppliers, top management make efforts to standardize the TQM implementation processes, top management make efforts to establish quality assurance management systems and that the implementation of the TQM practices includes the constructs of management commitment and contribute to improved supply chain performance as shown by a mean of 4.0, respectively. The study also found out that top management are in the fore front to initiate a culture of quality in the organization processes , that top management is willing to take accountability for inventory management and delivery timelines as shown by a mean of 3.6 and that top management make efforts to streamline TQM systems as shown by a mean of 3.5. This finding was added weight by Dilberet al, (2005) who emphasized that managers are also required to provide adequate resources to the implementation of quality efforts, the resources includes time, work force and appropriate funding that should drive competitive and viable decisions geared to make the implementation of TQM successful.

Regression Analysis

In addition, the researcher conducted a linear multiple regression analysis so as to test the relationship between the independent variables on total quality management. The researcher applied the statistical package for social sciences (SPSS) to code, enter and compute the measurements of the multiple regressions for the study.

Table 1: Model Summary

Model	R	R Square	Adjusted Square	R	Std. Error of the Estimate
1	.897a	.880	.133		.3195

The adjusted R2 is the coefficient of determination. This value explains how total quality management varied with employee training, cost reduction, support of top management and information technology. The four independent variables that were studied, explain 89% of the total quality management as represented by the R2. This therefore means that other factors not studied in this research contribute 11% of the total quality management giving room for further research to investigate these other factors (11%) that affect total quality management.

Table 2: ANOVA

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	11.534	5	2.878	52.400	.0073
	Residual	186.555	27	2.129		
	Total	198.089	32			

According to Mugenda & Mugenda (2003) ANOVA is a data analysis procedure that is used to determine whether there are significant differences between two or more groups or samples at a selected probability level. An independent variable is said to be a significant predictor of the dependent variable if the absolute t-value of the regression coefficient associated with that independent variable is greater than the absolute critical t-value. The regression analysis also yields an F-statistic where if the calculated F-value is greater than the critical or tabled F-value, the prediction will be rejected. In this study, the significance value is .0073 which is less than 0.05 thus the model is statistically significant in predicting employee training, cost reduction, support of top managers and information technology. The F critical at 5% level of significance was 3.23. Since F calculated is greater than the F critical (value = 52.400), this shows that the overall model was significant.

Table 3: Coefficient of Determination (CD)

	Unstandardized Coefficients	Std. Error	Standardized Coefficients	t	Sig.
	B		Beta		
(Constant)	3.657	1.033		0.787	0.255
Employee training	1.654	0.107	0.159	1.091	0.002
Cost reduction	0.988	0.139	0.085	0.687	0.005
Information Technology	0.444	0.069	0.210	0.349	0.032
Top management support	0.568	0.097	0.145	0.97	0.013

The researcher conducted a multiple regression analysis so as to determine the relationship between supply chain performance and the four variables. As per the SPSS generated on table 4.9 above, the equation ($Y = \beta_0 + \beta_1X_1 + \beta_2X_2 + \beta_3X_3 + \beta_4X_4 + \varepsilon$) becomes:

As per the SPSS generated the established regression equation was:

$$Y = 3.657 + 1.654 X_1 + 0.988 X_2 + 0.444 X_3 + 0.568 X_4 + \varepsilon$$

Where:

Y = Supply chain performance

X1 = employee training

X2 = Cost Reduction

X3= Information Technology

X4= Support from top management

ε = the error

According to the regression equation established, taking all factors into account (employee training, cost reduction, top management support and information technology.) constant at zero, supply chain will be 3.657. The data findings analyzed also show that taking all other independent variables at zero, a unit increase in employee training will lead to a 1.654 increase in supply chain performance; a unit increase in cost reduction will lead to a 0.988 increase in supply chain performance, a unit increase in support of top managers will lead to a 0.568 increase in supply chain performance and a unit increase in information technology infrastructure will lead to a 0.444 increase in supply chain performance. This infers that support from top managers contribute more to the supply chain performance followed by the cost reduction. At 5% level of significance and 95% level of confidence, employee training had a 0.002 level of significance; cost reduction showed a 0.005 level of significant, support from top managers showed a 0.013 level of significant, IT had a 0.032 level of significant, and hence the most significant factor is employee training.

Conclusions

From the findings of this study, it can be concluded that employee training is a fundamental aspect that shapes the workers skills by offering them with the relevant competences which are vital recipes that facilitate total quality management. Employees are equipped with the necessary quality aspects that help them to understand the underlying principles of TQM and this enhances optimum logistics service provision at DHL Kenya. The study also concludes that, cost management, top management support, adequate technology solutions, strategic partnering and

skilled personnel are some of the key factors that work towards enhancing supply chain efficiencies and effectiveness that are derived from TQM implementation.

It can also be concluded that, information technology affects the implementation of TQM to a very great extent because new technologies are promising to save costs, to improve customer and supplier relationships, enhance supply chain performance, and to open new business opportunities. Information technology more so supports organizations in responding better to existing challenges by offering real time information that is useful in tapping new strategic plans and improving the anticipation of future developments. From the findings, the study concludes that support from top management affects the TQM implementation process to a great extent as managers are committed to staff development and career enhancement. Top management encourages collaborative relationships with suppliers for TQM implementation and they also make efforts to standardize the procurement processes while establishing quality assurance management systems. Top on the implementation practices includes the constructs of management commitment meant to improve the quality of service to the customers.

Recommendations

The study saw support from top managers as the highest variable as a contributor to supply chain performance and therefore it should be management led, and for it to have a long lasting effect it should involve everyone at DHL. This means that management should be actively involved, committed to the initiative and needs to provide an environment that nurtures employee's talents and efforts. The organization needs to develop a valid measure of team performance. The reward system for performance should not be based on individual performance but rather on team work. Outstanding team performance should be reimbursed so that the whole team could be encouraged to participate in the TQM initiative. When team members are encouraged they will perform even better thus increasing their satisfaction with the job that they are doing while increasing their self-esteem and performance levels. As the study suggested, DHL should invest more on new technologies to save costs, to improve customer service and supplier relationships, business processes and performance, and to open new business opportunities. It might also help the organization to respond better to existing challenges and improve the anticipation of future developments.

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