# Application of lean six sigma in supply chain and logistics management essay samp...

Business, Management

1. Introduction

Most organizations have experienced success after they introduced corporate-wide Lean Six Sigma initiative. According to Brett & Queen (2005), it is essential for to consider how lean Sic Sigma can be institutionalized within the supply chain and logistics. According to these authors, after successfully implementing Lean Six Sigma at a firm, its management must consider continuing and extending the improvement rate through applying Lean Six Sigma in its Supply chain. Mileham (2007) argues that those activities that cause the customer’s critical to quality issues and generate the longest time delays in any business process provide the greatest opportunity for the business to improve on quality, cost, lead time and capital hence the need for application of Lean Six Sigma which seeks to reduce cost and improve lead time by optimizing on processes while at the same time focusing on meeting and satisfying customer requirements as well as the expectations of stakeholders and on improving quality by having the defects measured and eliminated (Bogart 2007). Lean Six Sigma is all about making processes faster and improving on quality. This concept emphasizes that excellence, speed and discipline go hand in hand.

Supply Chain (SC) refers to a network of micro and macro enterprises or organizations that are involved, via upstream and downstream linkages, in different processes and activities that produce value in the form of service and in the hands of ultimate customer. Supply chain management (SCM) is on the other hand defined as the task of integrating organizational units along SC and coordinating flows (materials, information, financial) in order to

fulfill (ultimate) customer demands with the aim of improving competitiveness of SC as a whole (Stadtler & Kilger, 2001). Applying Lean Six Sigma in supply chain and logistics management means providing Six Sigma quality products and services within the shortest possible time and lowest possible cost without experiencing the issues that are associated with customers and suppliers (Oakland & Marosszeky 2006). That is providing Six Sigma products without experiencing poor delivery performance from suppliers or poor understanding of the requirement of customers. Lean Six Sigma is a concept that seeks growth and effectiveness and not just cost cutting or efficiency. It drives firms to do better things in addition to doing things better so as to achieve the main goal which is growth and effectiveness (Hahn, Hill  Hoerl & Zinkgraf 1999). Based on this, this study seeks to explore the application of this concept in supply chain and logistics management.

1. 1 Research Objectives

The main aim of this study is to explore application and implementation of Lean Six Sigma in supply chain and logistics management to establish its significance in management of these operations. To achieve this, the study will seek to achieve the following objectives;

1. To establish how Lean Six Sigma improves effectiveness in supply chain and logistics management
2. To determine how Lean Six Sigma improves customer-orientation within supply chain and logistics management.

3. To find out whether application of this concept improves customer satisfaction
4. To establish how application of Lean Six Sigma in supply chain and logistics management contributes to the overall growth of the organization.

2. Literature Review

The Lean Six Sigma is currently considered an important strategic tool for any organization that is keen on performance (Byrne, Lubowe & Blitz, 2001). Traditionally, lean methods were commonly used in the manufacturing industries for operational control and quality improvement and thus focused on waste elimination or value addition (Poppendieck 2002). Gupta (2005) recognize the importance of Six Sigma and suggests for its institutionalization in the supply chain.

Lean Six Sigma is a combination of lean goals and six sigma methodology in the strategic management of organizations for a number of benefits. According to Byrne, *et al.* (2001), this methodology has developed over time to incorporate a number of organizational activities. Through Lean Six Sigma approaches, firms become inherently inclined to innovation, and the people become visionary. Lean methods therefore enables organizations to eliminate activities that mislead the organization from working towards attaining its goals while the Six Sigma focuses on customer-oriented activities and meeting the expectations of the stakeholders including customers and suppliers as well as shareholders (Martin 2007). Such firms therefore have are oriented towards customer satisfaction and market

insight (Vavra 2007). The Six Sigma methodology focuses on continuous improvement of process so as to reduce variations and thus maintain value and eliminate risks through the DMAIC factors (Define, Measure, Analyze, Improve and Control) (Byrne *et al* ., 2001).

Lean Six Sigma methodology can be used in management process improvement, and cost reduction through process optimization (Byrne *et al* ., 2001). This involves cutting down unnecessary processes or actors in the supply chain and leave only the ones that add value or eliminate waste (Kumar, Jensen & Menge 2008).

Firms that have tested and benefited from incorporating Lean Six Sigma in their Supply and Logistics chains include Motorola, Dell’s Corporation, Toyota and Chrysler (Poppendieck, 2002). Caterpillar applied the same approach to revive its revenue earnings in 2001 while ScottishPower used the same to regain its market share (Byrne *et al.* , 2001).

## 3. Methodology

### 3. 1 Research Design

This study seeks to explore the application of lean six sigma in supply chain management and logistics management. Based on the aim and objectives of the study, the researcher seeks to collect both qualitative and quantitative information. Qualitative information will consist of detailed explanations of how six sigma is applied in the management of these processes while quantitative data will be numerical data on the performance of the studied

companies on application of six sigma. The researcher intends to use secondary data in addition to primary data.

3. 2 Data Collection

3. 2. 1 Primary Data

1. i) Qualitative Data

Qualitative data will be collected using semi-structured interviews which will be administered personally (directly). Semi-structured interviews are the recommended tool in research methodology when seeking data that is rich, in-depth and detailed. King (2004) refers to semis-structured interviews as qualitative explanatory interviews. This is because they are mostly used in qualitative explanatory studies such as this case more than they are in other types of studies. These interviews are valued for their flexibility in that they allow the researcher to tailor the questions in a manner that enables them to investigate the complexity of the study (Leedy & Ormrod 2005). In semi-structured interviews, the researcher usually has a standard set of questions covering different themes. The researcher has other subsequent questions that seek further probing and clarification based on the response to the standard questions. Though these interviews are time consuming, they give data that is rich and in-depth based on the respondent’s experience which increases validity of the findings.

Quantitative data will be collected using a questionnaire with closed-ended questions. This will require the subjects to respond according to the available options nest to the question. A likert 5-point scale will be used to group the

responses given by the employees to the questions in the questionnaire. This scale will apply the use of 1, 2, 3, 4 and 5 to imply totally agree, agree, not sure, disagree, totally disagree. Examples of questions that will be asked include; “ Do you agree that implementing lean six sigma improves the performance of the organization?” “ Do you agree that application of lean six sigma improves understanding of customer requirements as well as the delivery performance of suppliers?” Closed-ended questionnaires are preferred because they are easier to administer and consume less time. They also give quantitative data which is much faster to analyze as compared to qualitative data (Curwin & Slater 2007) .

The researcher chose to combine qualitative and quantitative methodology because quantitative results often support or oppose the themes arising from qualitative data (Creswell 2007). This is a way of validating the findings as quantitative results act as a confirmatory tool to the qualitative results therefore increasing the validity and reliability of the results.

### 3. 2. 2 Secondary Data

To obtain secondary data, the researcher will critically appraise and review published articles (peer-reviewed journals and papers) and books of prior studies on related topics. To attain these sources, key words which will have been prepared will be entered in online databases and libraries such as ebsco, ProQuest, Questia and Emarald amongst several others. The abstracts of the obtained articles will be read through to determine their content and if they are found relevant, the whole article will be reviewed. The main advantage using secondary data is that it is more economic to obtain as

compared to primary data in terms of both money and financial resources. Conducting a primary research is much more expensive considering that one must allocate funds for preparing (printing) the questionnaire or interview questions, transport, and wages for research assistants to help in data collection. Even when secondary data has to be bought, the amount used is much less than the amount used in primary research (Flick et al., 2005). Secondary data is also faster to collect and analyze as the data is clean and has already been analyzed. However, one is not able to tell the errors that were committed and the magnitude of their impact on the findings (Flick et al., 2005). This compromises the reliability of secondary data. However by reviewing as many sources as possible and comparing the findings, one can validate the findings.

Secondary data is often used to validate the findings obtained in primary research.

3. 3 Sampling

Strategic sampling will be used in primary research where only those relevant to the research question and objectives will be used as subjects. In this case, only the supply chain and logistics managers, and the staff in these departments in the companies to be studied will be used as subjects.

3. 4 Data Analysis

Data from interviews and secondary sources will be analyzed using content analysis. According to Creswell (2007), content analysis allows inferences to

be made by identifying specified characteristics of the responses or text collected from various people and sources in a manner that is systematic and objective. This tool is also replicable. It categorizes data according to the arising themes and meanings allowing similarities to be identified. Content analysis eliminates subjectivity and simplifies trends. The final results are often quantitative in spite of the data being qualitative. After analysis, the researcher can for example conclude that firm A improved its performance by 40% on application of lean six sigma.

Data collected by the likert tool will be analyzed by SPSS which presents results as graphs, charts or polygons. SPSS is superior to other tools such as excel because it allows more analysis tools, is faster, gives results that and is can be applied to descriptive statistics.

3. 5 Validation

To validate the results, the researcher will compare the findings with those of other authors who have conducted similar studies to establish how they compare. This strategy which is referred to as ‘ multiple perspectives’ is allowed for such studies where triangulation is not possible (Saunders, Lewis & Thornhill 2007).

5. Expected Outcomes

Lean Six Sigma is method of operation that combines lean methods with six Sigma approaches. Lean approaches seek to reduce cost by optimizing on processes while six sigma is focused on meeting and satisfying customer

requirements as well as the expectations of stakeholders and on improving quality by having the defects measured and eliminated. Lean Six Sigma therefore borrows from the principles, tools and philosophies of both the two approaches (Mileham 2007). It is expected that organizations that apply Lean Six Sigma experience effectiveness in addition to efficiency in their supply chain and logistics activities (Vavra 2007). In addition to cost cutting, such organizations also experience growth and perform better. It is therefore expected application of Lean Six Sigma in supply chain management and logistic management allows managers to do better things in addition to doing things better hence are able to meet their customers' requirements and avoid suffering from poor delivery performance by the suppliers.

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