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**FACULTY OF ECONOMICS AND BUSINESS ADMINISTRATION  
QUALITY MANAGEMENT**

NEBEOLISAH, CHUKWUEBUKA FRANC

**INFLUENCE OF SUPPLY CHAIN QUALITY MANAGEMENT TO  
COMPETITIVE ADVANTAGE**

**Master Thesis**

Allowed to defend \_\_\_\_\_

Master Student \_\_\_\_\_

Academic Supervisor \_\_\_\_\_

Prof. D. Serafinas

**Vilnius, 2019**

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## DEFINITION OF TERMS

**Supply Chain:** This is simply referred to as a network between a company and its suppliers to produce and distribute a specific product; it's basically the steps taken to get specific products or services to the customer. An IBM distinguished professor of Operations Management defines supply chain as business activities needed to design, make, deliver, and use a product or service,<sup>1</sup> in other words, it is the composition of all the companies involved in the design, production, and delivery of a product to the market.

**Management:** This simply refers to the process of dealing with or controlling things or people. It is the organizational process that includes strategic planning, setting objectives, and managing resources, deploying human and financial assets needed to achieve objectives as well as measuring results.<sup>2</sup>

**Supply Chain Management:** This is defined as the integration of key business processes from end user through original suppliers that provides products, services, and information that add value for customers as well as other stakeholders.<sup>3</sup> According to Chopra, SCM is the coordination of production, inventory, location, and transportation among the participants in a supply chain to achieve the best mix of responsiveness and efficiency for the market being served.

**Quality management:** Quality management has a direct impact on supply chain performance measures. A continuous quality management improvement reduces defects in a company's supply chain.<sup>4</sup> Moreover, quality management practices reduce process variance, which has a direct impact on such supply chain performance measures like inventory and time measures.<sup>5</sup>

**Supply Chain Quality Management:** Mostly considered as the integration of quality and supply chain management, SCQM refers to the formal coordination and integration of business processes involving all partner organizations in the supply channel to measure, analyse and continually improve products, services, and processes in order to create and achieve satisfaction of intermediate and final customers in the market.<sup>6</sup> SCQM according to (Zeng et al 2013), requires

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<sup>1</sup> Sunil Chopra. *Basic Concept of Supply Chain Management*.

<sup>2</sup> Amy Hissom (2009). *Introduction to Management Technology*. Kent State University.

<sup>3</sup> Croxton, Sebastian, Lambert & Rogers (2001). *The Supply Chain Management Processes*.

<sup>4</sup> Fish (2011). *Supply Chain Quality Management. Pathways for Research and Practice*, Prof.DilekOnkal (Ed.), ISBN: 978-953-307-294-4, InTech, Available from: <http://www.intechopen.com/books/supply-chain-management-pathways-for-research-and-practice/supplychain-quality-management>

<sup>5</sup> Flynn et al (2009). *The impact of supply chain complexity on manufacturing plant performance*.

<sup>6</sup> Zeng, Phan & Matsui (2013). *Supply chain quality management practices and performance: An empirical study*.

<sup>14</sup> Poter (1987). *Competitive strategy : The core concept*

simultaneous integration of internal practices, upstream supplier quality performance and downstream customer requirements.

*A competitive advantage* is <sup>14</sup>what makes an entity's goods or services superior to all of a customer's other choices. The term is commonly used for businesses. The strategies work for any organization, country, or individual in a competitive environment.

## INTRODUCTION

Organizations are gradually showing more concern in the area of supply chain quality management, as this represents one of the powerful new sources of competitive advantage. Supply Chain Management (SCM) involves the process of bringing product to market for the purpose of serving satisfied customers.<sup>7</sup> Supply chain management refers to the delivery of enhanced customer and economic value through synchronised management of the flow of physical goods and associated information from sourcing to consumption). Supply chain management is very important for every organization nowadays as it helps these companies to remain competitive in the market. One most important feature of a supply chain is the art of integration which would help companies to grow and develop their business functions.<sup>8</sup> In other words, it is an approach to integrating suppliers, manufacturers, distributors as well as retailers, in order for products to be produced and be distributed at the right time, to the right location and the right quantities.<sup>9</sup>

When looking at supply chain quality management, we are considering the quality at which an organization attains in manufacturing its products or providing its services through integration of key business process across the supply chain. To successfully thrive in today's business environment, managers ought to effectively integrate their goals in order to be able to compete in the dynamic, global economy, and as well be able to focus on the final customers which should be their driving force of improvement. Another study found that healthcare supply chain management creates room for improvement in the healthcare sector.<sup>10</sup> Quality management is however needed in every organization as an approach for supporting all the components of a business to the quality requirements of the client or customer, in order to maximize quality and reduce waste.<sup>11</sup>

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<sup>7</sup>Sotiris Zigiari (2000) "Supply Chain Management."

<sup>8</sup>Lynn A. Fish (2011). Supply Chain Quality Management, Supply Chain Management - Pathways for Research and Practice, Prof.Dilek Onkal (Ed.), ISBN: 978-953-307-294-4, InTech, Available from: <http://www.intechopen.com/books/supply-chain-management-pathways-for-research-and-practice/supplychain-quality-management>.

<sup>9</sup>Simchi-Levi et al, (2008), Supply Chain Quality Management, Supply Chain Management.

<sup>10</sup>Ik-Whan G. Kwon, Sung-Ho Kim & David G. Martin (2016). Healthcare supply chain management; strategic areas for and financial improvement. *Technological Forecasting & Social Change* 113 (2016) 422 – 428.

<sup>11</sup>Fernandes, Sampaio and Cavalho (2014) "Quality Management and Supply Chain Management Integration: A Conceptual Model". Proceedings of the 2014 International Conference on Industrial Engineering and Operations Management Bali, Indonesia, January 7 – 9, 2014.

Supply chain quality management (SCQM) is therefore the integration between quality management and supply chain management.<sup>12</sup> Past researches have confirmed that supply chain management and quality management are important for every organization as they make them competitive in their respective markets. Furthermore, continuous quality improvement has a positive impact on company's inventory levels, product and process variation, flexibility, responsiveness, as well as final customer satisfaction.<sup>13</sup> The **aim** of this master's thesis is to define how supply chain quality management could give a competitive advantage over other competitors.

**Relevance of Research:** The study is focused on analysing the entire concept of the supply chain quality management and examines how different factors of supply chain quality management influences competitive advantage. Hence, this study is suitable for referencing in future studies.

**Research Problem:** Most organizations nowadays have adopted the concept of supply chain management in their manufacturing process because of the ease of the flow of goods and services from the movement and storage of raw materials to the final stage of finished goods which is then transported from point of origin to point of consumption. However, there are organizations that cannot effectively or qualitatively manage their supply chain and therefore are not able to meet up to the standard of larger firms as well as their inability to thrive in a competitive business environment. There is therefore need to analyse the concept of supply chain quality management and review its impacts on organizations. Hence the research question; *does supply chain quality management have a positive impact on an organization by giving it a competitive advantage in the industry in which it operates?*

**Research Object:** The object of this research is the influence of supply chain quality management on company competitive advantage.

**Research Goal:** To define the supply chain Quality management factors influencing competitiveness of organizations.

**Research Objectives:**

1. To analyse the concept of supply chain quality management

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<sup>12</sup>Lin and Gibson, 2011 as cited by A. C. Fernandes et al., 2014, "Quality Management and Supply Chain Management Integration: A Conceptual Model".

<sup>13</sup>Lynn A. Fish (2011). Supply Chain Quality Management, Supply Chain Management - Pathways for Research and Practice, Prof.DilekOnkal (Ed.), ISBN: 978-953-307-294-4, InTech, Available from: <http://www.intechopen.com/books/supply-chain-management-pathways-for-research-and-practice/supplychain-quality-management>.



2. To investigate how this concept is beneficial to organizations in terms of ease of production and cost efficiency.
3. To carry out an empirical research on the effects of supply chain quality management on companies.
4. To evaluate the impacts of supply chain quality management on companies competitive advantage.

**Research methods:** Quantitative and qualitative methods were used. A qualitative research method – interview was employed in this study through the use of a descriptive research design, since the goal is to analyse the supply chain Quality management factors influencing competitiveness of the organizations.

**Method of gathering data:** An online survey was employed as the method of data gathering. The survey contain questions covering the whole spectrum of supply chain quality management. The survey questionnaire was distributed mainly to employees of organizations since the study is organization based. The main targets audience was employees who work in logistics or supply chain division/sectors in companies. The survey questionnaire cover the size of the company and duration it has been in business as well as the industry they belong to.

Apart from the survey questionnaire, an interview will also be conducted with specialist in the field of supply chain management; these interviews will be able to determine the influencing factors of quality management in a supply chain. Also, the interview questions are from elements of supply chain quality management, which are the factors influencing quality, competitiveness in the supply chain system and experts were asked if one element or the other influences companies' competitive advantage. During the interview, keywords will be noted as well in order to observe how many experts and how they use the same keyword or concept. After gathering information and data from survey and interviews respectively, analysis of results will be collected and explicitly explained. The data collected from the survey will be computed with the help of a Microsoft Excel Tool. Finally, conclusions were drawn based on the analysed results. The chapter subsequently ended with drawing a general conclusion of the study as well as proposing some recommendations to present the master's thesis relevance for future researches.

**Research structure:** This master's thesis has three main parts. The first encompasses the theoretical framework of the research which analyses the whole concept of supply chain and quality management, including some models and elements. The second chapter covers the methodological part of the master's thesis, which explains what kind of research and how it is

done while the third part covers the methodological aspect of the research. While the third part of the master's thesis includes the empirical analysis of the research. The study is subsequently followed by conclusions and possible proposals/recommendation.

This section of the study basically gives an idea of the thematic scheme of this study through the brief introduction of the research topic as well as the definitions of the main terms. The following section will therefore render an in-depth understanding of the concept of supply chain and quality management.

# 1. CONCEPTUAL FRAMEWORK OF SUPPLY CHAIN QUALITY MANAGEMENT

## 1.1. The principles of supply chain quality management

The quality of a supply chain lies in how well activities coordinate across the supply chain to create value for customers and at the same time increase the profitability of every link in the chain. An increasing number of managers have discovered how to keep their chain of customers going, and achieve profitable growth simply by treating supply chain management as a strategic variable.<sup>14</sup> There are basically two important things managers pay attention to in order to maintain a quality supply chain in the supply chain logistics. Firstly, managers base their thoughts on the supply chain as a whole. In other words, they recognize the links involved in managing the products, services and information flow from their suppliers' supplier to the customers' customers. Secondly, these managers pursue tangible outcomes – they focus on revenue growth, asset utilization, and cost.

There are numerous challenges attributed to the process of supply chain, thus, it is critical to identify quality issues early in the supply chain in order to manage quality related costs and risks.<sup>15</sup> The ability to manage all aspects of the supply chain results in having quality controls and assurance stages throughout a company's business project, as well as ensuring that suppliers deliver on company's and clients' expectations, avoids delays and other compromising situations.<sup>16</sup> Moreover, a poor supply chain quality control leads to break and wear out of products before their warranty period expires, thus the failure to protect customers' interest and the subsequent loss of customers' trust and loyalty.<sup>17</sup> However, quality management practices reduce process variance, which has a direct impact on supply chain performance measures, such as inventory and time measures.<sup>18</sup> It is necessary to note that supply chain members move only 'good' units, and not defective units through the supply chain. Thus, a proper supply chain management will help to create fewer defects and reduce the amount of defective inventory in the supply chain.

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<sup>14</sup> David L. Anderson, Frank F. Britt, & Donavon J. Favre (2007). The principles of supply chain management.

<sup>15</sup> Sparta Systems (2016). Best Practices to Improve Quality in the Supply Chain.

<sup>17</sup> Rose Hoyle (2017), Supply Chain Quality Management: *Control it before it controls you.*

<sup>17</sup> Joseph DeBenedetti. *Importance of Quality Control in Supply Chain Management.* <http://smallbusiness.chron.com/importance-quality-control-supply-chain-management-80588.html>.

<sup>18</sup> Lynn A. Fish (2011). Supply Chain Quality Management – Pathways for research and practice.

The primary objective of supply chain management is to construct and operate a competitive supply chain<sup>19</sup>, however, there are a number of barriers that prevent the achievement of this objective. For instance, uncertainty of demand in most supply chain environments is huge if not adequately addressed which could reduce the potential performance of supply chain in terms of unit cost, quality, speed, as well as responsiveness. Moreover, supply chains with long and variable response times cannot take full advantage of collaborative relationships due to their inability to respond to environmental changes. Also, Companies may lack the capabilities necessary to acquire, store, manipulate, and transmit data effectively due to poor information infrastructure, and finally, inadequate design of decision support systems, operating policies as well as performance metrics that guide daily operating decisions may create room for supply chain uncertainty. Thus, for a supply chain to be effective, the following principles are to be considered.

**Thorough knowledge of customer:** Customer's requirements tend to influence the level of success gained by a supply chain, thus, if these customer's requirement are not clearly understood or defined, a supply chain cannot be effectively constructed.<sup>20</sup>The use of the classical market research techniques, the construction of an information infrastructure to capture customer transaction data, the storage and analysis of the data will help with the understanding and the definition of customer's requirements.

**Customization of logistics network for each segment:** It is needful to have different logistics network for each segment of the market that will meet every customer's need, however, designing logistics network is a type of initiative driven mainly by customers.<sup>21</sup> Whether companies take gigantic approach to logistics network design in organizing their inventory, warehouse, and transportation activities to meet a single standard or design a logistic network to meet the average service requirements of all customers; or even strive to satisfy the toughest requirements of a single customer, a superior asset utilization cannot be completely achieved, neither can the segment-specific logistics necessary for excellent for supply chain management be accommodated. Rather, the network requires a more robust logistics planning enabled by real-time decision-support tools that can handle flow-through distribution and more time-sensitive approaches to managing transportation.

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<sup>19</sup> John Muckstadt, David Murrat, James Rappold& Dwight Collins (2003). The five principles of supply chain management, *an innovative approach to managing uncertainty*.

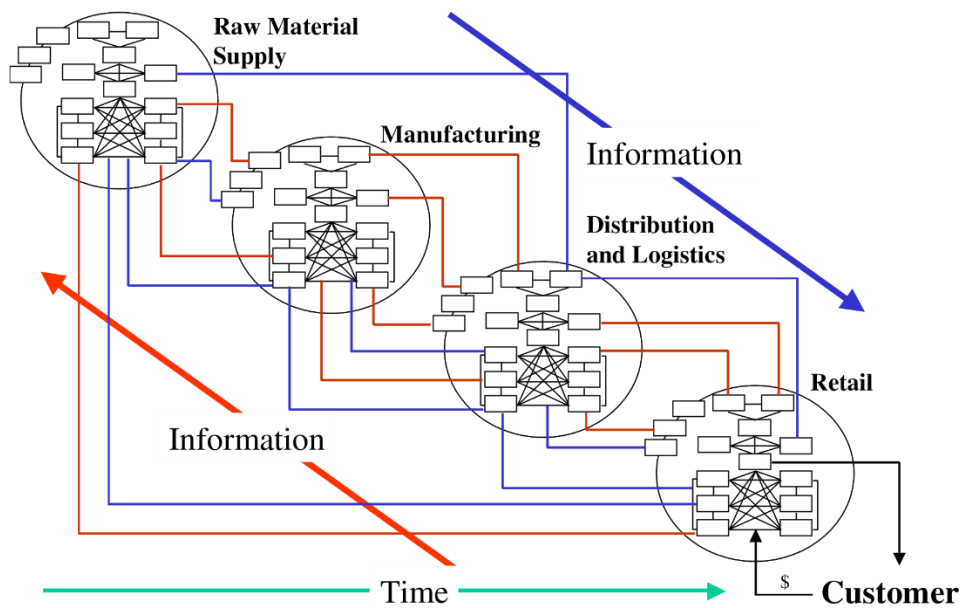
<sup>20</sup> John A. Muckstadt. David H. Murray, James A. Rappold& Dwight E. Collins (2003). *An innovative approach to managing uncertainty in the supply chain management*.

<sup>21</sup> David Aderson, Frank Britt & Donavon Favre (2007). *Principled of the Supply Chain Management Explained*.

**The creation of a supply chain information infrastructure:** For a supply chain to gain a competitive advantage, it is necessary to create an effective intra and inter organization information infrastructure. For instance, the B2B collaboration of businesses through the internet nowadays has created an easier way in which supply chain partners can share timely demand information, inventory status, daily capacity usage requirements, evolving marketing plans, product and process design changes as well as logistics requirements. However, successive business collaboration requires not just data exchange between successive supply chain partners but mostly about joint planning of inventory and production strategies as well as the reliable execution of operational plans on a continuing basis.

**Business processes integration:** There has to be an integration of business processes both in the intra and inter organization in order to support the supply chain strategic objectives. This will therefore help support the organization’s efficient flow of material through the supply chain. The figure below demonstrates how organization’s supply chain should be integrated.

**Figure 1: Integrated information systems and business process**



*Source: John A. Muckstadt et al (2003)*

The design of these processes is necessary in an intra and inters organization as it increases the information that drives daily supply chain decisions.

**Unification of decision support systems:** The main goal of support systems is basically to generate plans that simultaneously consider all elements of the supply chain. Thus, before implementing an IT project for instance, company has to carry out business process engineering, in order to be equipped with the full understanding of process deficiencies to know what kind of

technology is really needed. However, for companies to an effective system that can enhance real-world operations, managers need to build an information technology system that integrates capabilities of three crucial kinds – in the short term, medium term as well as the long-term. When dealing on the short-term, the system must have the ability to handle day-to-day transactions and the electronic commerce across the supply chain; the system must also help to support supply and demand by sharing information on orders as well as daily scheduling. From the medium-term point of view, the system has to facilitate planning and decision making, supporting the demand and shipment planning and master production scheduling needed to allocate resources efficiently. And finally, in the long-term, the system must enable strategic analysis by providing tools, such as an integrated network model that will synthesize data for use at the high-level. The above principles are basically the critical steps to follow and achieve a quality supply chain management.

## 1.2. The supply chain models

According to the CEO of Deutsche Post DHL, (Appel 2003), “supply chain and transport providers need to manage multiple risks along the sourcing, transport and distribution chain.”<sup>22</sup> Hence, using the right supply chain modelling tool can help keep cost and inventory out of supply chain while improving service to customers.<sup>23</sup> Models could therefore be referred to as a representation of the system; they are often used to achieve a single goal or a set of objectives, such as maximizing service or minimizing inventory costs. A UK based logistics and supply chain consultancy “*the Logistics Business*” defines supply chain model as a strategic and systematic coordination model for supplying products to the end user or customer.<sup>24</sup> Thus, supply chain models are a model that provides oversight of materials, finances, and information as they move from the supplier to the end user. According to the logistics business, modelling a company’s supply chain could impact the company’s business in different ways such as:

- i. Boosting the company’s customer service. Modelling a supply chain ensures that a company’s goods or products are assorted and delivered in the right quantity and in a timely fashion, as well as ensuring that the company’s products are available at the right locations as customers expect.

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<sup>22</sup> World Economic Forum (2012). New models for addressing supply chain and transport risk. file:///C:/Users/Daughter%20of%20Zion/Desktop/Supply%20Chain%20QTY%20MGT/WEF\_SCT\_RRN\_NewModelsAddressingSupplyChainTransportRisk\_IndustryAgenda\_2012.pdf.

<sup>23</sup> Leslie Hansen Harps (2003). Optimizing your supply chain: A model approach. <http://www.inboundlogistics.com/cms/article/optimizing-your-supply-chain-a-model-approach/>.

<sup>24</sup> The Logistics Business (2017). Supply Chain Model. <https://www.logistics.co.uk/supply-chain-model/>.

- ii. Modelling can also improve a business bottom line. Modelling a company's supply chain decreases the use of large fixed assets like warehouses, manufacturing/production plants, as well as transportation vehicles. It also raises a company's cash flow because the delivery of products of company to consumers can be expedited and profits received faster.
- iii. Moreover, supply chain modelling helps to improve company's integration process, reduces inventory costs of company, provides company with efficient production strategy as well as provides a better platform for information sharing between employees, partners, clients and stakeholders.

There are a number of supply chain models, which address both the upstream and downstream elements of supply chain management (SCM). The SCOR (Supply-Chain Operations Reference) model, developed by a syndicate of industry and the non-profit Supply Chain Council became the cross-industry de facto standard defining the scope of supply chain management. SCOR measures total supply chain performance. It is a process reference model for supply-chain management, spanning from the supplier's supplier to the customer's customer. It includes delivery and order fulfilment performance, production flexibility, warranty and returns processing costs, inventory and asset turns, and other factors in evaluating the overall effective performance of a supply chain. The use of modelling techniques is a significant part of companies who are deciding upon their new logistics network.<sup>25</sup> These techniques can allow companies to look at a comparison of the functioning, cost efficiency, and customer service efficiency of the various logistics networks that have been proposed. Companies can look at the different modelling techniques and decide which one offers them the best insight into their network options.

### **The modelling techniques in a supply chain**

- i. **Optimization model:** The optimization model is derived from the precise mathematical procedures that offer the paramount or optimal solution based on the mathematical formula used. It is based on mathematical formula only, which means that there is no subjective input to the model, only assumptions and data. The optimization model looks at data such as the level of customer service to be obtained, the number and location of distribution centres, the number of manufacturing plants, the number of distribution centres assigned to a manufacturing plant, and the inventories that must be maintained. One optimization model that has been used for logistics networks is the model using linear

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<sup>25</sup> Martin Murray (2017). What is supply chain and logistics network modelling? <https://www.thebalance.com/logistics-network-modeling-2221320>.

programming, otherwise known as LP. This is mostly useful for linking supply and demand limitations of manufacturing plants, distribution centres, and market areas. Given the goal of minimizing costs, linear programming can define the optimum facility distribution pattern, based on the constraints identified. However, as this uses mathematical formulas, there is no allowance for any subjective input.

- ii. **Simulation model:** This model is defined as creating a model that is based on the real world. When the model has been created, you can perform experiments on the model to see how changes made to the model can affect the overall cost of the logistics network. For example, by changing the constraints on the network, it is possible using a simulation model to see how this affects the cost-effectiveness of the overall network. For a simulation model to be effective, company needs to collect significant amounts of data on transportation, warehousing, labour costs, material handling, and inventory levels, so that when changes are made to the constraints, the model accurately reflect the changes. However, the changes to the simulation model will not produce the optimum logistics network, as produced by the optimization model; it will just evaluate the changes that were made to the model. This type of model is very useful when companies have made general decisions on the network and want to see what the overall effect of any changes will be.
- iii. **Heuristic model:** This model is similar to simulation model; heuristic model does not generate an optimum solution for a logistics network. A heuristic model is used to reduce a large problem to a more manageable size. It should be understood that heuristic models do not guarantee a solution and that a number of heuristic models may contradict or give different answers to the same question and still be useful to the overall creation of a logistics network. Heuristic models are often referred to a "rule of thumb" which can be useful in creating a logistics network. For example, a heuristic model can be used to consider the best site for a distribution centre that is at least ten miles from the market area, fifty miles from a major airport, and more than three hundred miles from the next closest distribution centre. A heuristic model will look at all areas that fit within the parameters defined, and finds the area's best suited.

The use of models in a company's supply chain is very important because it will enhance company's products. According to a research, the proper management of a supply chain has a



direct impact on the product quality as well as the overall profitability of a company.<sup>26</sup> Thus, it is worth noting that quality management in the supply chain is very critical for the acquisition and maintenance of a competitive edge in the marketplace, as well as the reduction of operating costs.

### 1.3. Quality management in the supply chain

Most manufacturing companies today are faced with the numerous challenges of managing their organization's quality and compliance initiatives.<sup>27</sup> According to (Wilderman, 2015) charting out the problem statement is important when embarking on a quality management initiative. Quality management of a company's supply chain also requires knowledge management and continual improvement.<sup>28</sup> Other important things a company should note while managing quality in its supply chain are preparation and planning. For instance, if a company carries out its design review, assess the factory as well as possible risk before the production process; this can result in the reduction of risk of non-compliant products being sold.

A study by the Global Expert for Supply Chain Management and Quality Control found that quality management must and should be the integral part of every supply chain management supplier evaluation and qualification;<sup>29</sup> this according to the expert will help the supplier avoid life cycle cost. Moreover, quality creates a huge impact on almost every step in the production process for final product assembly or services provided. It has become an increasingly important issue in organizations,<sup>30</sup> thus, it is crucial to develop sustained resource management. According to a study by Sparta systems, today's diverse nature of supply chain also creates an enormous risk to businesses, thus, reducing this risk requires increasing the number, frequency and length of the supplier evaluations and audits. Moreover, there are several practices for managing quality in the supply chain which include:

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<sup>26</sup> Joseph DeBenedetti (2017). Importance of Quality Control in Supply Chain Management. <http://smallbusiness.chron.com/importance-quality-control-supply-chain-management-80588.html>.

<sup>27</sup> Roy C. Wilderman (2015). A step-by-step guide to enterprise quality management. [https://go.spartasystems.com/PPC-EMEA-BusinessCase\\_G-2015\\_Whitepaper-BusinessCase\\_G-EMEA-July2015.html?msclkid=693ab30be84f1833d316e958f29474e4&utm\\_source=bing&utm\\_medium=cpc&utm\\_campaign=EMEA%2520-%2520UK%2520-%2520Quality&utm\\_term=quality%2520control%2520system&utm\\_content=QMS%2520-%2520Quality%2520Management%2520System](https://go.spartasystems.com/PPC-EMEA-BusinessCase_G-2015_Whitepaper-BusinessCase_G-EMEA-July2015.html?msclkid=693ab30be84f1833d316e958f29474e4&utm_source=bing&utm_medium=cpc&utm_campaign=EMEA%2520-%2520UK%2520-%2520Quality&utm_term=quality%2520control%2520system&utm_content=QMS%2520-%2520Quality%2520Management%2520System).

<sup>28</sup> Bureau Veritas UK and Ireland (2017). Supply Chain Quality Management. [www.bureauveritas.co.uk/services+sheet/service\\_sheet\\_13529](http://www.bureauveritas.co.uk/services+sheet/service_sheet_13529).

<sup>29</sup> Arshad Hafeez (2017). Role of quality in supply chain management. <https://supply-chain.cioreview.com/cxoinight/role-of-quality-in-supply-chain-management-nid-4519-cid-78.html>.

<sup>30</sup> Ana Cristina et al (2014). Quality Management and supply chain management integration: A conceptual model.

- i. **Broadening supplier assessments:** Organization's focus on supplier measurement and monitoring should be based on *suppliers that comprise the target portion of spend; suppliers that have a strategic relationship with regard to a key product; suppliers that have a strategic.* Companies that pay less attention to these measures are more exposed to potential quality incidents and increase in costs which can pose a negative impact on profits as well as brand reputation.
- ii. **Defining clear measurement program:** Supply chain partner performance could be measured in specific areas such as *quality, on-time delivery, service, price, total cost, contract compliance, and responsiveness.* However, businesses could face some measurement challenges like *large number of suppliers; disparate data sources; inconsistent goals and metrics as well as limited systems and analytical tools.*
- iii. **Investing in infrastructure that supports visibility into the supply chain:** Most companies still maintain the traditional processes that are supported with email and fax, which data are maintained in isolated repositories. However, leading companies are investing in infrastructure that strongly connects their supplier ecosystem and programmes manually or disconnected processes.
- iv. **Closing the quality loop with suppliers:** Just as most leading companies nowadays, companies should adopt the prospect of leveraging technology to connect and integrate suppliers into quality management processes. By so doing, they will be able to extend the features and benefits of their internal management systems to suppliers.

Quality management in the company's supply chain requires a thorough scrutiny especially regarding the company's relation with its supplier. Many business organizations have therefore come to discover the benefits derived from the integration of quality management and supply chain management. According to a study, quality management (QM) and supply chain management (SCM) strengthen the competitiveness of an organization as well as improve customer satisfaction.<sup>31</sup> However, quality management (QM) is more focused on continuous quality improvement and participation, whereas SCM lays emphasis on supplier relationship and management as well as timely delivery of products and services.

Quality management or quality control is a key to creating a smooth supply chain and also being able to manage the supply chain effectively. A study asserted that a prerequisite to supply chain quality is the effective implementation of QM internally within individual supply chain

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<sup>31</sup>Talip, Qureshi & Rahman (2011). Integrating total quality management and supply chain management: Similarities and Benefits.

members. An effective quality management helps supply chain managers to be able to protect the integrity of their company's operations as well as protecting employees and stakeholders from being exposed to the harmful side-effects of toxic or unwanted materials. According to a study, quality management has a great impact on the efficiency and speed of a company's supply chain.<sup>32</sup> Quality, as stated by Atkinson, is tasked with inspecting company's incoming raw materials, in-process work and final product before being shipped.

### 1.3.1. Factors influencing Quality in a Supply Chain

Companies need to examine their activities as related to comparative, if they want to gain competitive advantage in the market in which they operate.<sup>33</sup> Supply chain management is used by companies in order to reduce delivery time, improve financial performance, create a high customer satisfaction, as well as build suppliers' trust.<sup>34</sup> However, research has it that companies now – in recent time find it difficult to control their supply chains which has resulted in a high cost of failure.<sup>35</sup> To avoid this failure, there are several factors to be considered in order to achieve a quality supply chain management. The following are some factors that influence quality supply chain:

**Commitment and Understanding from Employees:** It is key for organizations to ensure that all their employees know about the Total Quality Management (TQM) policies and make them a fundamental part of their work. Companies' employees should be aware of corporate goals and recognize the importance of these goals to the overall success of that organization. Employees need to know what is expected from them and why, because when employees understand and share the same vision as management, a world of potential is unleashed. If they are in the dark, commitment is lacking and policies will not be successfully deployed.

**Quality Improvement culture:** The organizational culture needs to be modernized on a continuous basis to encourage employee feedback. Employees are often full of valuable knowledge, which could add value to the organization. Employees must feel respected and valued when they share their ideas on how to improve operations; they need to know management respects their ideas or they will not share.

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<sup>32</sup> William Atkinson (2010). The role of quality in supply chain efficiency. *How to leverage a better quality process to improve cash flow and reduce working capital requirements.* <https://www.sdexec.com/warehousing/article/10243292/the-role-of-quality-in-supply-chain-efficiency>.

<sup>33</sup> Md. Rajib Hasan and Mohammad Abdul Alim (2010). Factors Affecting Supply Chain Management Efficiency in Cross Border Outsourcing: *Case study of H&M and its Outsourcing Operations in Bangladesh.*

<sup>34</sup> Henry Quesada, RadoGazo & Scarlett Sanchez (2012). Critical Factors Affecting Supply Chain Management: A Case Study in the US Pallet Industry.

<sup>35</sup> Andrew Allen (2013). Seven Factors of Supply Chain Failure. <https://www.cips.org/supply-management/news/2013/june/seven-factors-of-supply-chain-failure/>.

**Continuous improvement in process:** Quality Management (QM) is a continuous process and not a program. It requires constant improvement in all the related policies, procedures and controls established by management. Companies ought to constantly do research, and pay close attention to the market, make an effort to routinely revise all aspects of their operation. There should be a constant effort to improve proficiency – which will result in constant scopes for improvement (*despite the size of the improvement*).

**Focus on customer requirements:** In today's market, customers require and expect perfect goods and services with zero defects. Focusing on customer requirements is significant to long term survival and essential in order to build relationships with customers. People do business based on emotion. Competitors will always be at risk. Companies must learn to keep customers close and happy. The precise requirements of all customers should be documented and understood by everyone that touches the account.

**Effective control:** It is essential for companies to monitor and measure the performance of its business. It's easy to forget how many times in a year an employee does not conform to a controlled procedure or how many times a piece of equipment was down due to unplanned maintenance. If strict documentation is maintained, company will be able to objectively quantify areas for improvement and focus its efforts where they will provide the greatest return of both its time and financial resources.

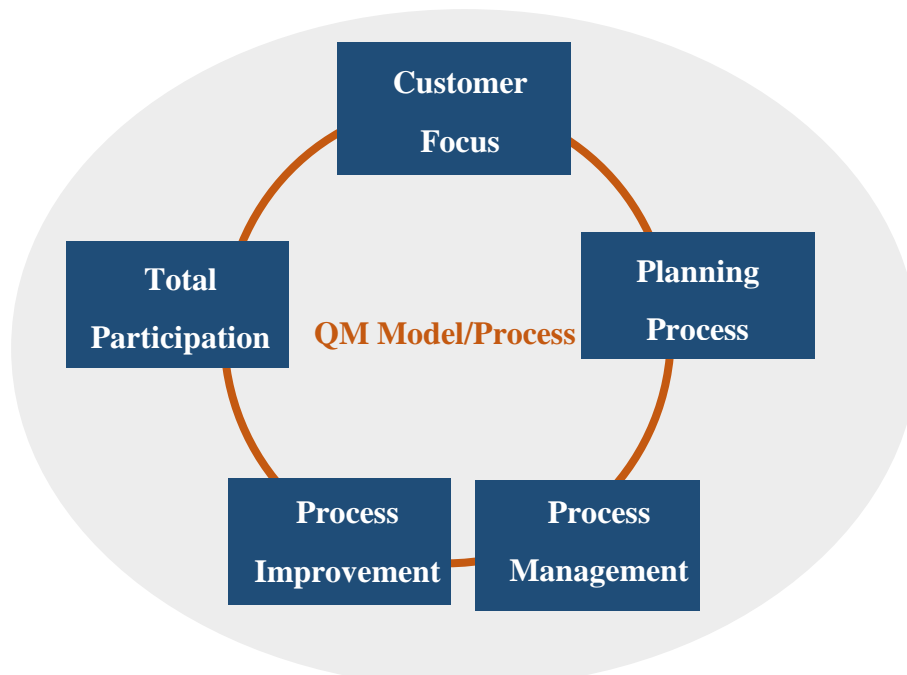
### **1.3.2. Quality management model/process**

Quality management ensures superior quality products and services,<sup>36</sup> and its process refers to a set of procedures followed to ensure that companies produce a satisfactory end result. According to the management study guide, the quality of a product can be measured in terms of performance, reliability and durability. QM process could be achieved by setting quality targets which are in sync with customers' expectations. The steps undertaken to measure and report the actual quality of products delivered are 'Quality Assurance Process' and 'Quality Control Process'. The Quality Management process or model is represented in the figure below:

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<sup>36</sup> Management Study Guide. *Importance of Quality Management*. <http://managementstudyguide.com/importance-of-quality-management.htm>.

**Figure 2: Quality Management Process**



*Source: John A. Muckstadt et al (2003)*

Quality management is important for every organization as it creates superior quality products which are essential to not only meet the needs of customers but rather, exceed their satisfaction. QM uses methods such as Total Quality Management (TQM) or Six Sigma with the common goal of delivering a high quality product for customers' satisfaction and resulted loyalty. There are therefore several models of Total Quality Management (TQM) which numerous organizations are adopting.

TQM according to the management study guide is defined as a combined effort of both top level management and employees of an organization to frame effective strategies /policies to deliver high quality products to meet the needs of customers as well as exceed customers' satisfaction. It is also defined as a management philosophy that highlights the need to improve the quality of goods and services for a better utilization of organization's resources, it also gives each individual an edge to participate, contribute and develop a sense of ownership.<sup>37</sup> There are several models of total quality management, hence, each organization can select and implement the model suitable or more convenient to its structure. The various models include:

- i. **Malcolm Baldrige Model:** This quality model was implemented in 1987, named after a once Secretary of Commerce to the United States – Malcolm Baldrige who was known to

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<sup>37</sup>Seetharaman, JaYashree& Peng Boon (2006). Critical success factors of total quality management. *Quality & Quantity* (2006) 40:675-695.

be an advocate of quality management as a key to U.S. prosperity and sustainability.<sup>38</sup> The goal of this model was basically to enhance the competitiveness of U.S. businesses. The figure below depicts the full composition of the Baldrige model:

**Figure 3: The Malcolm Baldrige Model**



Source: Baldrige (2014)

- ii. **European Foundation for Quality Management:** This model is based on criteria and sub criteria such as “Policy” and “Strategy” which has to be communicated and executed by a framework of key processes.<sup>39</sup>The full criteria of the EFQM include: *leadership, people, policy & strategy, partnerships & resources, processes, people results, customer results, society results, and key performance results.*
- iii. **ISO Quality Management Standards:** This model is based on the requirements of what measures to be taken; for instance, organizations must determine the sequence and interaction of processes. The ISO standards address various aspects of quality management; provides guidance and tools for companies and organizations that would like to ensure that their products and services consistently meet customer’s requirements, and the consistent improvement of quality.<sup>40</sup>

Adopting one of the above mentioned models of Total Quality Management helps to position the organization for greater success; this is because both top management and employees of organization have the opportunity to contribute to improving the quality of organization’s

<sup>38</sup> Col. AL Faber, President and CEO of *the Partnership for Excellence*. The Baldrige Criteria for Performance Excellence Innovation: *Process to Results*.

<sup>39</sup>Ir Peter W.M. van Nederpeld EMEA (2009). Object Oriented Quality Management. *A management model for quality*.

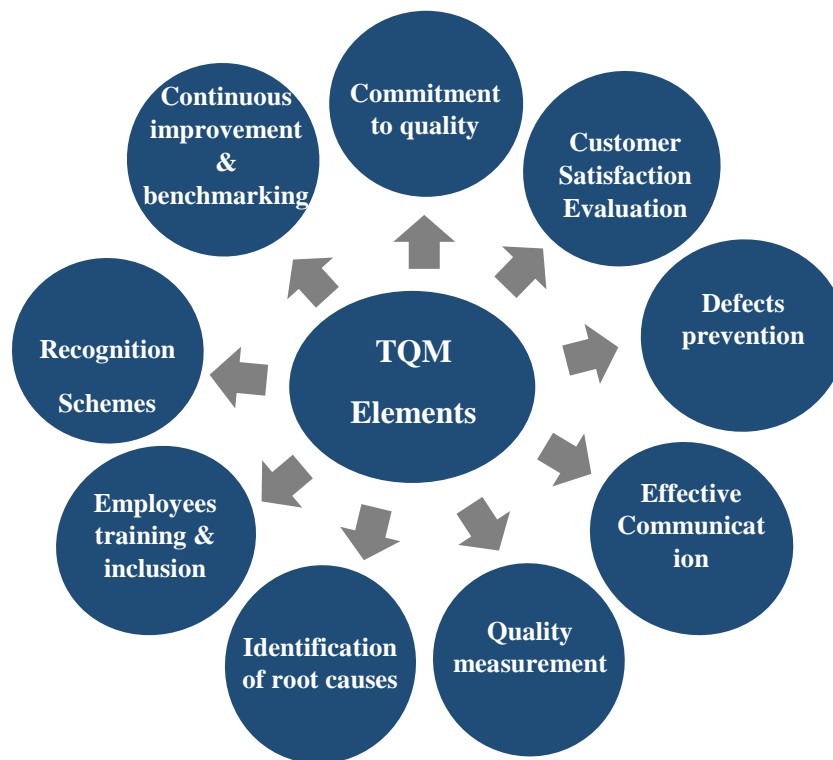
<sup>40</sup> International Organization for Standardization. *ISO-900 – Quality management*. <https://www.iso.org/iso-9001-quality-management.html>.

products or services. Furthermore, quality management or total quality management of an organization is also determined by various elements which are discussed below.

### 1.3.3. Quality Management Elements

Quality is an essential parameter which helps organizations outshine their competitors and survive the fierce competition.<sup>41</sup>Total quality management can be summarized as a management system for a customer-focused organization that involves all employees in continual improvement.<sup>42</sup>It also describes an idea that makes quality the driving force behind leadership, design, planning, and improvement initiatives.<sup>43</sup>There are therefore various elements which determine the success of total quality management. The TQM elements are represented on the model below:

**Figure 4: Total Quality Management elements**



Source: Computed by Author cited D Gustafson (2002)

The figure above is a model which demonstrates the total quality management elements. These elements are further explained below:

<sup>41</sup> Management Study Guide. *Elements of Total Quality Management*. <https://www.managementstudyguide.com/elements-of-total-quality-management.htm>.

<sup>42</sup> American Society for Quality. *Total Quality Management – Primary Elements*. <http://asq.org/learn-about-quality/total-quality-management/overview/primary-elements.html>.

<sup>43</sup> Nayantara Padhi – iSixSigma. *The eight elements of Total Quality Management*. <https://www.isixsigma.com/methodology/total-quality-management-tqm/eight-elements-tqm/>

- i. **Commitment to quality:** To implement TQM in an organization, the top management of that organization has to take the lead with full commitment. This could be done by the management initiating quality improvement programmes. Quality programmes are largely carried out by numerous countries in response to the numerous concerns about quality,<sup>44</sup> including quality strategy, hospital programmes, quality accreditation, assessment and review processes. Thus, quality improvement is provided by collecting, reporting and the use of quality related cost information.
- ii. **Customer satisfaction Definition and Evaluation:** Designing TQM should be done in such a way that the expectations of customers will be ultimately met. This is because customers are seen as the most important persons for any business; moreover, the existence of any organization depends on customers.
- iii. **Defects prevention:** In TQM, it is mainly about preventing the poor quality of products or services with such techniques as statistical process control, continuous process improvement as well as problem solving and system failure analysis.
- iv. **Effective communication:** Effective communication is another key element of TQM. This helps to bind employees and extracts the best out of them. It enables the employees to interact with each other, raise the problems found in the system as well as find the solutions to this problem.<sup>45</sup> There are three forms of communication applicable to TQM, these include;
  - **Downward communication:** This has to do with the flow of information from the top management to the employees.
  - **Upward communication:** This involves information flow from the employees to the top management.
  - **Sideways communication:** Communication at this level takes place between various departments, it also permits dealing with customers and suppliers more professionally.
- v. **Quality measurement:** It is very pertinent to understand that quality in itself is measurable and thus the current quality levels of organization's products or services ought to be known at all time. Organizations should know the level of quality they have attained and also know the level they are aspiring for, that way, TQM can be maintained.

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<sup>44</sup> J. Ovretveit & D Gustafson (2002). *Evaluation of quality improvement programmes.*

<sup>45</sup> Management Study Guide. *Elements of Total Quality Management.*  
<https://www.managementstudyguide.com/elements-of-total-quality-management.htm>



- vi. **Identification of root causes:** When the root causes of problems are identified, repetition of these problems can therefore be prevented. TQM aims at preventing these problems from repeating by developing means and corrective actions to solve the problem at the root level.
- vii. **Employees' training and inclusion:** Highly productive employees are as a result of proper training. It is important for managements or supervisory bodies to implement TQM within their departments and their employees its concept and techniques. The most common trainings employees require include interpersonal skills, the ability to function within teams, decision making skills, problem solving skills, job management performance analysis and improvement, business economics as well as technical skills. Moreover, the inclusions of employees in organization roles are also very important. For instance, every employee ought to be involved at every step of production process, thus taking part in helping the organization to meet its targets.
- viii. **Recognition schemes:** Another key element of TQM is recognition. The main aim of TQM is to develop long term relationships with quality suppliers rather than suppliers of inferior goods.
- ix. **Continual improvement and benchmarking:** TQM involves a continuous process of improvement covering people, equipment, materials as well as procedures. This has to do with every aspect of operation in an organization. Benchmarking on the other hand is a systematic method which has to do with enabling organizations to measure themselves against the best industry practices. It aims at developing best practices that will lead to better performance, by distinguishing organization's efforts with the best performance in the field and as well suggests how the gap between two performances can be removed.

### ***1.3.4 Benefits, barriers and bridges to a quality supply chain management***

Having a quality supply chain initiative has a significant impact on a company, thus to implement these initiatives is a vital part of companies today.<sup>46</sup> However, to get these initiatives working, the company requires a high level of commitment as it is a very complex process. For instance, in large international organizations, the process of developing a logistics strategy along the supply chain is a complex one. This is because to implement a strategy in a supply chain requires certain changes in the organization structure of the company,<sup>47</sup> changes in the physical infrastructure used to store and move the company's products, as well as changes in the IT

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<sup>46</sup> Eva Klemencic (2006). Management of Supply Chain – Case of Danfoss District Heating Business Area.

<sup>47</sup> Duncan Robert (2001). The Six Rules of Logistics Strategy Implementation. London: PA Consulting Group, 2001, p. 1-5

systems used to manage the quotation-to-invoice business processes, and most importantly, making changes to the way people work, reporting lines as well as the systems they use to undertake their changed roles within the organization. According to Duncan (2001), the following six rules could be used in order to implement successful supply chain management principles:

- Senior management team commitment
- Early introduction of performance measurement
- Identification/obtainment of the required level of implementation resources prior to the proposed project
- Effective communication – communication is the key driver of success
- Proceed to other areas, IT systems should not be an excuse for not proceeding
- Line management must be responsible for the implementation of the principles for a quality supply chain management – not the project team.

A study also outlined the most common benefits, barriers, and bridges found when in the process of implementing a quality supply chain practices. According to the research, 52 interviews were made with carefully selected companies who are deeply involved in the practice of quality supply chain management. The survey result as shown in table 2.4 below, suggested that the most common benefits of managing a quality supply chain are associated with increased responsiveness of the companies, lower cost, better quality, as well as having a closer relationship with partners.<sup>48</sup>

**Table 1: Benefits, Barriers, and Bridges to Supply Chain Quality Management**

Benefits	Barriers	Bridges
✚ The increase in customer responsiveness	✚ Inadequacy in information sharing	✚ Managerial support from senior and functional level
✚ Consistency on time-delivery	✚ Poor and conflicting measurement	✚ Trust
✚ Shorter order fulfilment lead times	✚ Poor organizational culture and structure	✚ Information sharing in an open and honest manner
✚ Inventory costs reduction	✚ Poor alliance management practices	✚ Alignment and rationalization of supply chain
✚ Improvement in asset utilization	✚ Constrained resources	✚ Education and training on supply chain
✚ Being able to handle and tackle unseen circumstances	✚ Inconsistency in setting operating goals	✚ Comprehensive and accurate
	✚ Lack of employee passion and empowerment	

<sup>48</sup> Fawcett Stanley (2003). Achieving World-Class Supply Chain Alignment: Benefits, Barriers, and Bridges. Centre for Advanced Purchasing Studies, 2001, p. 11.

<ul style="list-style-type: none"> <li>+ Reduced costs of purchased items</li> <li>+ Well-tailored relationships</li> <li>+ Higher quality of products</li> <li>+ Faster products innovation</li> </ul>	<ul style="list-style-type: none"> <li>+ Change resistant as well as lack of trust</li> <li>+ Absence of managerial commitment</li> <li>+ Poor understanding of supply chain</li> </ul>	<ul style="list-style-type: none"> <li>measures</li> <li>+ The use of supply chain advisory council</li> <li>+ Process documentation and process</li> <li>+ The use of pilot projects effectively</li> <li>+ Cross-experienced managers.</li> </ul>
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*Source: Fawcett (2003)*

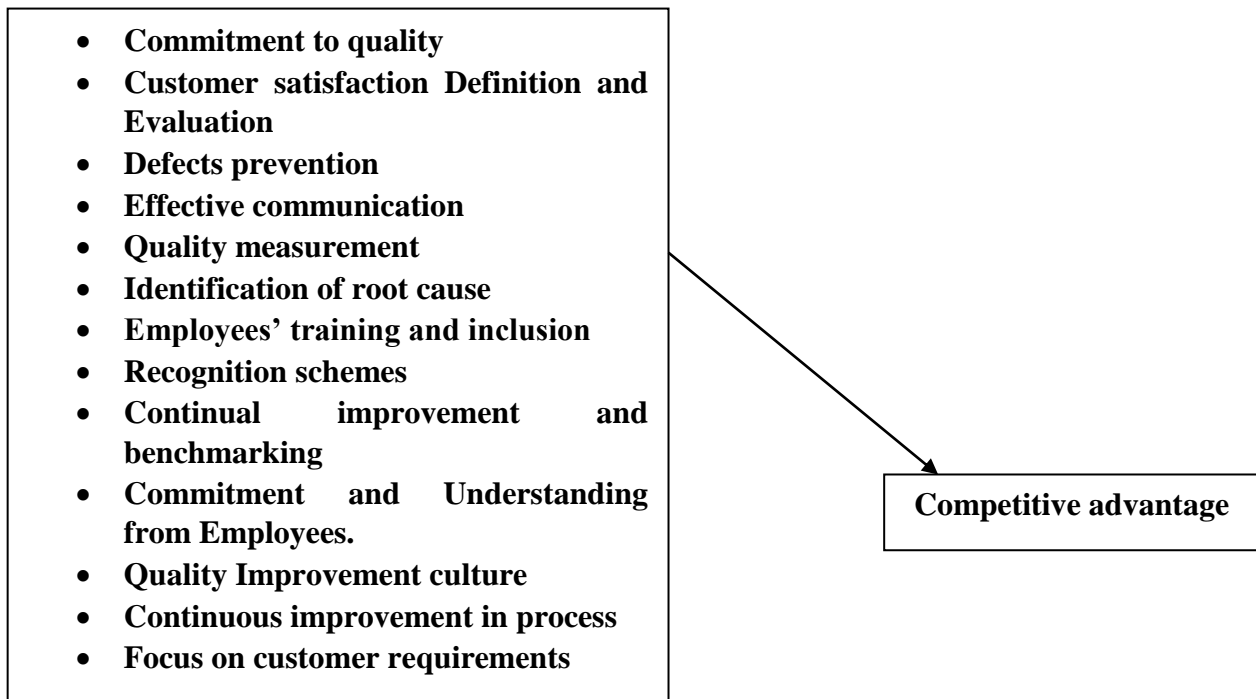
The above table presents the main benefits of having a quality management in a company's supply chain, as well as the barriers and the bridges to having a quality supply chain management. The barriers could therefore be summarised into management and organizational issues within the organization and with external partners.<sup>49</sup> The bridges could as well be summarised as having a good internal and organizational settings which include education and training of employees on how to manage and effective and quality supply chain.

Moreover, as we understand from this section, to successfully implement a quality supply chain practices, numerous issues have to be addressed in the company, which of course makes the implementation very complex, and as well requires very professional management of the organizations in supply chain as well as its relationships between its partners. Hence, the ability to manage the complexity in changes pertaining to the practices to implement a quality supply chain, it is important to consider using an external advisory councils to help bridge and overcome these related barriers.

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<sup>49</sup>Klemencic (2006). Management of the supply chain of Danfoss District Heating Business Area. Lubji University, Faculty of Economics, 2006.

*Figure 5: Supply chain quality management factors influencing competitive advantage*



*Source: computed by author*

The above figure depicts the list of elements of supply chain quality management that are believed to have impacts on competitive advantage of a company. These elements would be further examined by experts during the expert interview session. The following chapter will present the methodology of the research, the methodological development and model of the research.

## 2. RESEARCH METHODOLOGY

### 2.1. Goals, Problems and Objectives

The research was accomplished by using descriptive research design, since the aim of this research is to analyse the supply chain Quality management factors influencing competitiveness. Therefore an online survey was employed as the method of data gathering. After concluding the survey, the results show that further research needed to be done to clarify more, on the factors influencing competitiveness within supply chain quality management. Questionnaire was developed for an interview to be conducted with specialist in the field of supply chain management; these interviews helped to determine how the supply chain quality management factors influence competitiveness.

Furthermore, the interview questions comprised the elements of supply chain quality management, which are the factors influencing quality in the supply chain system and experts were asked if one elements or the other influences companies' competitive advantage. During the interview, keywords were noted as well. This was done in order to determine how many experts and how often they made use of the same keyword. After gathering information and data from survey and interviews respectively, the results were collected and explicitly explained, and Microsoft excel was used to compute the collected survey results. Conclusions were drawn based on the analysed results, and the chapter was rounded up by drawing a general conclusion of the study as well as proposing some recommendations to present the master's thesis relevant for future researches. The analysis does not contain correlations or regressions because interviews cannot be measured using those technique, a descriptive analysis was used in order to present responses as clearly and precise as possible.

**The object** of this research is impact of supply chain quality management on company competitive advantage.

**The goal** is to analyse the Influence of Supply Chain Quality Management in companies' competitive advantage.

#### **The practical problem**

Over the past decades, a lot has been said regarding supply chain quality management, which is considered as a vehicle through which firms can achieve competitive advantage in markets.<sup>50</sup> Most companies have made huge investments to streamline their supply chains in order to improve customer satisfaction and increase their internal productivity. According to a study,

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<sup>50</sup> Collin (2003). Supply chain management from strategy to implementation presentation.

individuals are actually not the ones that compete with one another these days; it is rather a problem between rival supply chains. Thus, the supply chains which provide value at its best to customers with the least cost in the chain dominate the network of individual companies. Based on these facts, supply chain quality management is very crucial, as companies are continuously seeking how to incorporate decisions across supply chain functions, geographically detached facilities as well as across time.

**There are objectives set to achieve the research goal:**

1. To evaluate the impacts of supply chain quality management on companies
2. To analyse the supply chain quality management.
3. To carry out an empirical research on the effects of quality management tools on the supply chain

The main question to be addressed in this research is:

**RQ:** *What factors of supply chain correlate with the competitive advantage in the industry?*

To examine research question, empirical research will be conducted. The quantitative research method is the most suitable method to be used. Quantitative research enables to identify the causes of scientist's observations. Surveys are conducted in an attempt to answer certain questions. They represent attempts to identify why something happens, what causes some event, or under what conditions an event does occur.

The strengths of this method are as follows;

1. Reliability and objectivity
2. Using statistics to generalize a finding
3. Possibility to reduce and restructure a complex problem to a limited number of variables
4. Looking at relationships between variables and possibility to establish cause and effect in highly controlled circumstances.
5. Assuming sample is representative of the population.
6. Subjectivity of researcher in methodology is recognized less.
7. Less detailed than qualitative data and may miss a desired response from the participant
8. The quantitative research is influenced by the empiricist paradigm, which means that it is concerned with cause and effect of social phenomena and uses the data - which is based on empirical.

## 2.2 Questionnaire development for survey

A survey questionnaire was created and distributed mainly to employees as the study is organization based. The main targets were employees who work in logistics or supply chain division/sectors in companies. The survey questionnaire targeted the size of the company and duration it has been in business, it also targeted what industry they belong to. Also, the impact it has on the general performance of these companies.

Different companies were involved in the survey globally to derive information about their different supply chain systems and how it is managed. Therefore the number of companies globally – the population is unknown. Some researchers propose that sample size shall be a minimum, as 5 times of number of variables. The number of variables analysed is 12. Therefore the minimum sample size is 60.

The survey was sent out via social media platforms; *on Facebook, as well as via emails*. A total of 70 participants were reached with the survey, however, 55 responses were gotten, and all 55 responses were complete making the rate of completion of the survey responses 100% this is because there was not possibility of not participating in the survey even if you don't work in the department of supply chain. The research results were analysed after running the statistical data with the use of excel tool. After collecting all the information, the author decided to develop another set questionnaire (Qualitative) and carry out personal interviews with people who directly work in supply chains or departments in companies with supply chain systems.

## 2.3 Questionnaire development for Interview

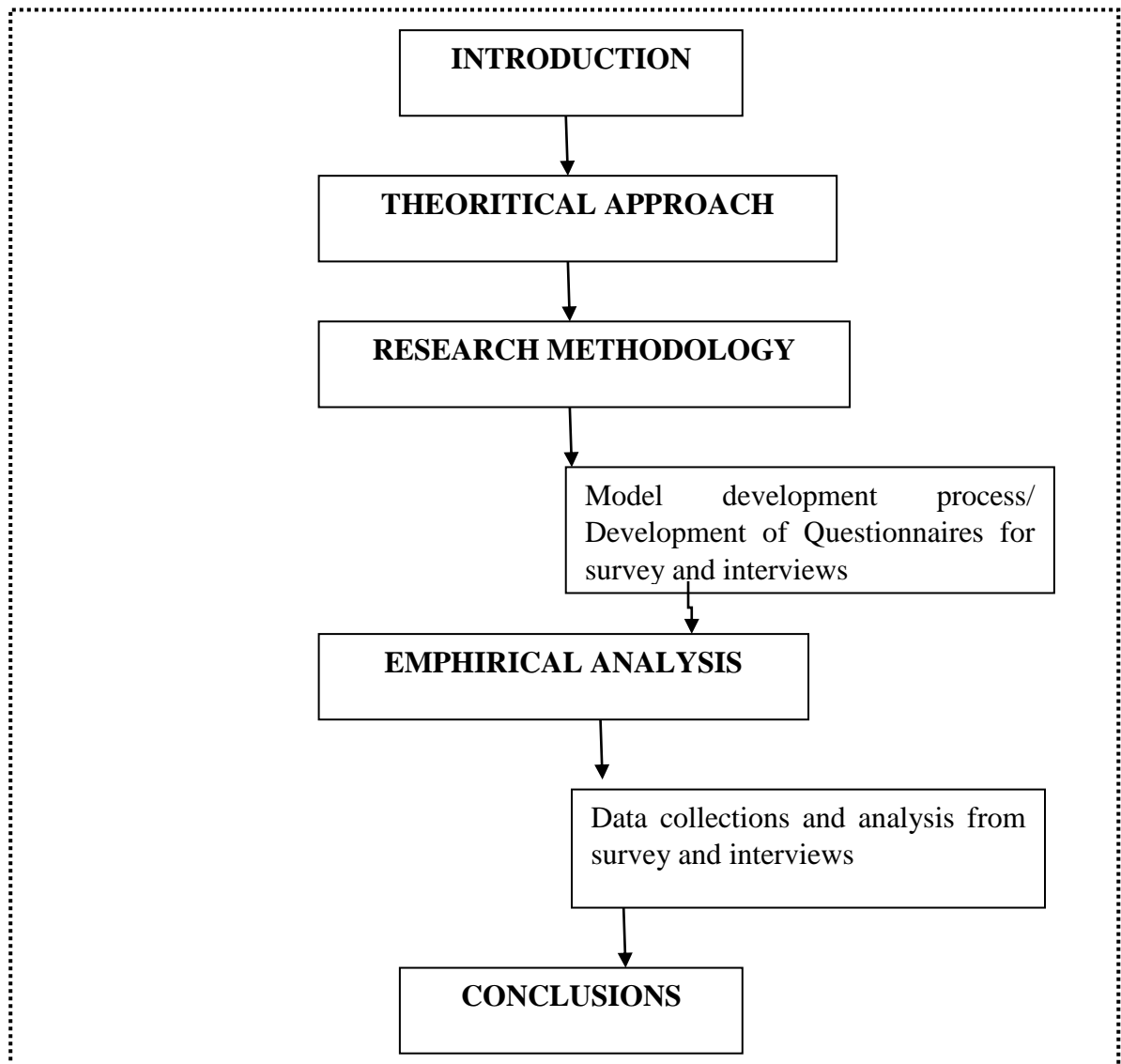
Questions for interview with experts were developed from the theoretical analysis, appointment for interviews was arranged with interviewer, these experts are directly involved in supply chain system, so they understand the angle every question is coming from or going to and gives their own companies insight on the question. Furthermore, questions relating to how commitment to quality influences companies competitive advantage was developed having into consideration that it influences companies competitive advantage, companies competitive advantage means factors that shows one company is in lead over another, they include, Cost efficiency, production efficiency, customer satisfaction, effective supply chain and right number of suppliers. During the theoretical analysis this questions allows us to know and understand its importance and how to affect competitive advantage. Also, questionnaire includes questions from customer satisfaction and definition, defect prevention, effective communication, quality measurement, identification of root cause problems, employee's trainings and inclusions, recognitions schemes, continual

improvement and benchmarking, commitment and understanding from employee, quality improvement culture, continuous improvement in process and focus on customer requirements.

### 2.3 Theoretical and methodological model of research

Research model is used to describe the overall framework of the research. Models identify and describe what the reality of the study is like, as well as the conditions by which it can be studied.<sup>51</sup> Thus there are various concepts (*ideas*) which are embedded in the model. In other words, model is used to indicate a set of related concepts. The figure below demonstrates the model of this study.

**Figure 6: Research Model**



<sup>51</sup> Clarke, R. J. (2005). Research Models and Methodologies. *HDR Seminar Series, Faculty of Commerce, Spring Session 2005.*



*Source: Created by Author cited Clark (2005)*

Developing a model is considered to be an effective research method, it assists investigators and scientists in relating more accurately to reality,<sup>52</sup> as well as aiding them to describe, predict, test and understand complex systems or events. Models often provide a framework for the conduct of research and might consist of actual objects or abstract forms like sketches, mathematical formulas or even representations of real-world phenomenon.<sup>53</sup> Thus the above figure demonstrates a structural representation of the research framework. The developed model is used to explain the trend of the research from the theoretical part, the methodological part as well as the empirical part. This chapter will be focused on the Research methodology as well as the empirical analysis of the research.

This section explains the process of model development including procedures used for literature search, instrument development, data collection and analysis.

To understand different theoretical and practical aspects of the study, a systematic search of the relevant literature will be carried out. For this purpose, different aspects of information system will be reviewed in detail. During the development of the Survey, Questions about factors and Results were analysed in the master's thesis, to enables us understand the level of impact the factors will have on the results. Furthermore, with a keen focus on the objectives of the study, a survey questionnaire was administered and distributed to respondents. The target audience of the survey was mainly employees and company owners. This is because author wants to examine how various organizations manage their supply chain and the effect of this on basic features of the organizations. A descriptive research approach will be employed in analysing the survey results – a descriptive research describes the current status of an identified variable and phenomenon. Thus, the survey will help in describing the management of supply chain in respective organizations.

After the collection of results is made from the administered survey, an empirical/a statistical analysis of the results will be carried out. An excel tool will be used as the tool to run the statistical analysis.

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<sup>52</sup>FarzanaShafique& Khalid Mahmood (2010). Model Development as a Research Tool: An Example of PAK-NISEA. *Library Philosophy and Practice*, 2010. ISSN 1522-0222.

<sup>53</sup> Powel &Connaway (2004). *Basic Research Methods for Librarians* (4<sup>th</sup> Edition). London: *Libraries Unlimited*.

## 2.4 Methodological Development

Methodology is the philosophical framework within which the research is conducted or the foundation upon which the research is based.<sup>54</sup> Research Methodology chapter of a research describes research methods, approaches and designs in detail highlighting those used throughout the study. Research Methodology chapter of a research describes research methods, approaches and designs in detail highlighting those used throughout the study. According to O’Leary,<sup>55</sup> methodology is described as the framework which is associated with a particular set of paradigmatic assumptions that we will use to conduct our research. As suggested by Allan and Randy in their study,<sup>56</sup> when conducting a research methodology, the following two criteria should be met:

- The methodology should be the most appropriate to achieve objectives of the research
- It should be made possible to replicate the methodology used in other researches of the same nature

According to a study, the most comprehensive information regarding vital aspects of methodology,<sup>57</sup> can be summarised as follows:

- Allow description of behaviour
- Does not support reliable predictions
- Does not support cause and effect explanations

This chapter of the research covers the methodological framework of the research, which comprises the theoretical and methodological model, the model development process, the methodological development as well as the method of gathering research data. The next chapter will be focussed on the empirical analysis of research, where the survey questionnaire will be analysed and the survey results also analysed.

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<sup>54</sup>Brown RB, (2006). *Doing Your Dissertation in Business and Management: The Reality of Research and Writing*, Sage Publications

<sup>55</sup>O’Leary Z. (2004) “The essential guide to doing research”. Sage

<sup>56</sup>Allan, AJ, Randy, LJ, 2005, *Writing the Winning Thesis or Dissertation. A Step-by-Step Guide*, Corwin Press, California

<sup>57</sup>Jackson (2011) as cited on the research methodology platform. *Methodology*. <https://research-methodology.net/research-methodology/>

### 3. EMPIRICAL ANALYSIS

This chapter covers the empirical analysis of the research, which comprises of the analysis of survey results quantitatively and the analysis of interview responses qualitatively. This part of the study will kick-off with the analysis of survey results, and subsequently present the analysis of interview responses. The chapter will finish by drawing conclusions and some recommendations at the wrap-up the study.

#### 3.1 Data collection and analysis for Survey (Quantitative Analysis)

Survey responses were extracted from the online survey platform into an excel sheet for analysis. The survey consisted of 10 option-based questions, which made it easy for the respondents to give complete answer to the survey. The responses will aid author in analysing the impact in which supply chain management tools have on an organization; hence proving an answer to the research question stated above. The respondents' responses will therefore be analysed below and would try to answer the research question:

Research Question: *What factors of supply chain correlate with the competitive advantage in the industry?*

To determine this relationship, a *Pearson's r* (correlation coefficient) will be calculated using a Microsoft Excel Tool. In *Pearson's r*, the closer to 1 (+1/-1) the value is, the larger the relationship. Statistically, it is generally accepted that the following scale can be used to estimate the effect size:

- Effect size: if  $r = +/- .5$ , it is large,  $+/- .3$  it is medium, and  $+/- .1$  it is small.

The Pearson's  $r$  correlation coefficient will be calculated using the some variables from the survey, the main aim of this correlation is to answer to the Research Question and determine the correlation between supply chain and competitive advantage.

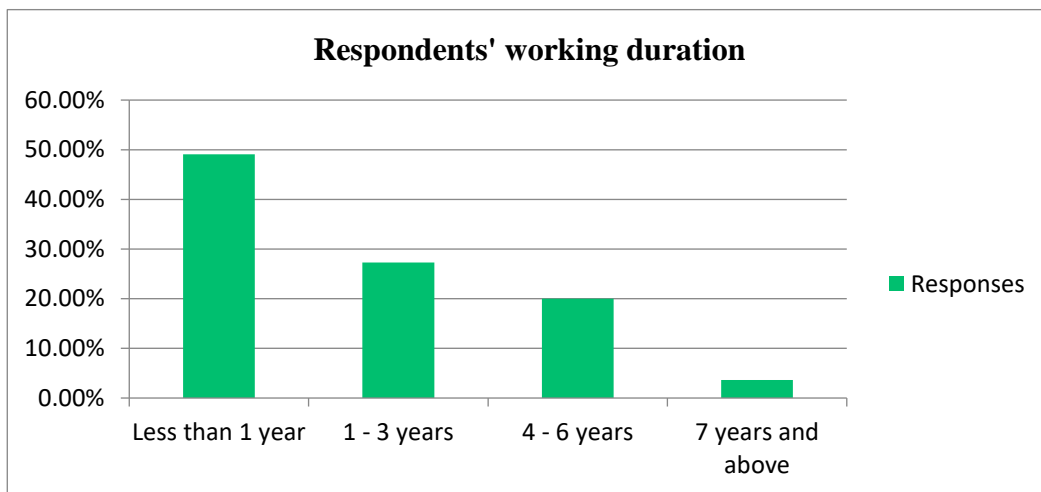
Author would like to start by analysing all the variables from the survey. The first variable in the survey is duration – how long respondents' have been working in their current organization. This variable is to determine how well the respondents know their organization. The table and chart below show the number and percentage of responses to the question of respondents' duration at work in their respective organization. The majority of the respondents have been in the organization for less than a year, while the least have been for over 7years.

**Table 2: Duration of respondents in their organization**

<b>Respondents' working duration</b>		
<b>Answer Choices</b>	<b>Responses</b>	
Less than 1 year	49.09%	27
1 - 3 years	27.27%	15
4 - 6 years	20.00%	11
7 years and above	3.64%	2
	<b>Answered</b>	<b>55</b>
	<b>Skipped</b>	<b>0</b>

*Source: Author, according survey responses*

**Figure 7: Duration of respondents in their organization**



*Source: Created by author, from survey data*

The most important indication that a company is doing well is the duration at which it has been in operation. One of the survey questions was to determine how long respondents' organizations have been in operation. The longer the organization has been in organization suggests that such an organization could have a quality supply chain which would aid its smooth operation in the market. The table is the summary of the responses from respondents. Majority of the respondents' organization have been operating for over 11 years.

**Table 3: Duration of respondents' companies in operation**

Duration of Respondents' companies in operation		
Answer Choices	Responses	
Under 1 year	10.91%	6
1 - 4 years	10.91%	6
5 - 10 years	32.73%	18
11 years and above	45.45%	25
	<b>Answered</b>	<b>55</b>
	<b>Skipped</b>	<b>0</b>

*Source: Author, according survey responses*

More detailed questions about respondents' organizations were also asked. One of such questions is how the organizations supply chain looks like. From table 4 below, the results show that most organizations have a short supply chain which comprises of only the supplier delivering to the manufacturer raw materials and the manufacturers deliver the products to the final consumers. A total of 37.50% of respondents responded that their organizations have such a supply chain. What this means is that such organizations are of small-scale business operation. However, the second most responses to this question was the longest chain which comprises of the five stages in a supply chain *supplier – manufacturer – wholesaler – retailer – final consumer*. This type of chain is common in large-scale organizations.

**Table 4: Structure of Respondents' Company Supply Chain**

Structure of Respondents' company supply chain		
Answer Choices	Responses	
Supplier - Manufacturer – Consumer	37.50%	21
Supplier - Manufacturer - Wholesaler – Consumer	16.07%	9
Supplier - Manufacturer - Retailer – Consumer	14.29%	8
Supplier - Manufacturer - Wholesaler - Retailer - Consumer	21.43%	12
Other (please specify)	16.07%	9
	<b>Answered</b>	<b>56</b>
	<b>Skipped</b>	<b>0</b>

*Source: Created by author*

Just as stated in the above table, the table below presents a summary of the responses on the number of employees in respective respondents' organization. The organizations with less than 50 employees are an example of a small-scale organization; while the ones over 251 employees 'show that such organizations have a large-scale business operation. Hence, most of the responses

were from organizations with less than 50 employees, followed by responses from organizations with over 251 employees.

**Table 5: Number of Employees**

Number of Employees		
Answer Choices	Responses	
Less than 50 employees	40.00%	22
51 – 150 employees	16.36%	9
151 – 250 employees	9.09%	5
251 employees and above	34.55%	19
	<b>Answered</b>	<b>55</b>
	<b>Skipped</b>	<b>0</b>

*Source: Created by author*

More specific questions were asked at the later end of the survey, more specifically about how efficient respondents think their organizations' supply chain is. The question was created on a scale of 1 to 5, (1 meaning not at all efficient, and 5 meaning highly efficient). The results gotten were on the average of 3.95 which shows a positive level. Majority of the respondents 41.82% responded to a somewhat efficient option while the second most responses 32.73% were gotten from highly efficient option.

**Table 6: Efficiency of Company's supply chain**

The efficiency of companies' supply chain											Total	Weighted Average
	Not at all efficient		not really efficient		Moderately efficient		Somewhat efficient		Highly efficient			
1	5.45%	3	1.82%	1	18.18%	10	41.82%	23	32.73%	18	55	3.95
											<b>Answered</b>	<b>55</b>
											<b>Skipped</b>	<b>0</b>

*Source: created by author below:*

Further analysis of the result is presented in the Pearson's *r* correlation as shown in the table below:

*Table 6a: Pearson's r correlation coefficient for efficiency of company's supply chain*

	Efficiency of Company's supply chain	Effective operation
Efficiency of Company's supply chain	1	
Effective operation	0.948865951	1

*Source: Author*

The table above presents the correlation coefficient for companies' supply chain efficiency and effective operation. Since the research focuses on determining factors which correlate with company competitive advantage, thus the correlation coefficient in the table above shows that there is a strong correlation between companies' supply chain efficiency and their effective operation. Therefore, it could be deduced that when there is efficiency in operation, companies' operation will be effective, and when companies' operate effectively, they tend to attain a high competitive advantage in the industry.

Apart from how efficient the respondents feel about their organizations' supply chain, they also provided responses to the quality of their organizations' supply chain. Majority of the respondents 41.82% agreed that company has a quality supply chain system, followed 25.45% of them who strongly agreed to this question. The question was also rated on a scale of 1 (strongly disagree) to 5 (strongly agree). A weighted average of 3.8 was gotten which also posed a positive response about organizations and their supply chain system.

**Table 7: Quality of companies' supply chain system**

The quality of companies' supply chain system											Weighted Average	
	Strongly disagree		Disagree		Neutral		Agree		Strongly agree			Total
Company has a quality supply chain system	3.64%	2	5.45%	3	23.64%	13	41.82%	23	25.45%	14	55	3.8
											<b>Answered</b>	<b>55</b>
											<b>Skipped</b>	<b>0</b>

*Source: Created by author*

A Pearson's correlation coefficient is presented in the table below to further analyse how quality in a company's supply chain could influence its competitive advantage in the industry.

*Table 7a: Pearson's r correlation coefficient for quality supply chain management and increase in company's revenue:*

	<i>Quality supply chain management</i>	<i>Increase in Company's revenue</i>
<i>Quality supply chain management</i>	1	
<i>Increase in Company's revenue</i>	0.989293985	1

*Source: Author*

The correlation table presents information showing the correlation between quality in supply chain management and increase in company's revenue, and it shows that there is a strong

relationship between quality management in a supply chain and increase in companies' revenue. This could imply that quality management in a supply chain strongly correlate with competitive advantage.

The more critical part of this survey was analysing the impact of companies' supply chain on customers. A list of five suggested impacts were provided, with the option of strongly disagree to strongly agree. Most responses fall in the range of "agree and strongly agree." On the overall, most respondents agreed that *the commitment and understanding of supply chain management policy has a positive impact on customers of their organizations*. The summary of these responses is given in the table and chart below.

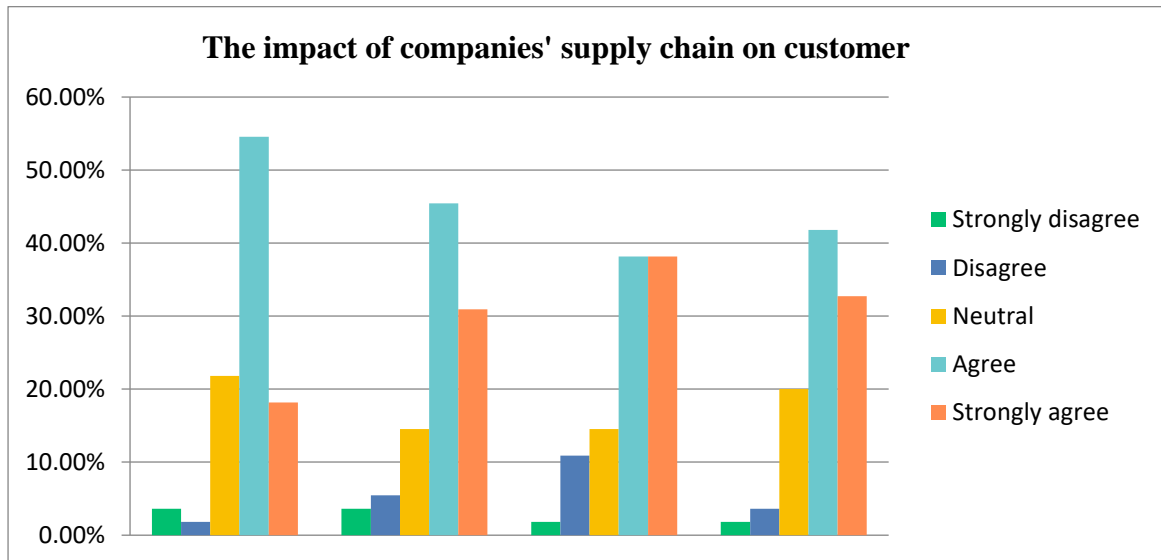
**Table 8: Impact of companies' supply chain on customers**

The impact of companies' supply chain on customers											
	Strongly disagree		Disagree		Neutral		Agree		Strongly agree		Total
Commitment and Understanding of supply chain management policy has a positive impact on customer	3.64%	2	1.82%	1	21.82%	12	54.55%	30	18.18%	10	55
Continuous improvement of supply chain managements has a positive impact on customer	3.64%	2	5.45%	3	14.55%	8	45.45%	25	30.91%	17	55
Focus on customer requirements has a positive impact on customer	1.82%	1	10.91%	6	14.55%	8	38.18%	21	38.18%	21	55
Effective control of supply chain managements has a positive impact on customer	1.82%	1	3.64%	2	20.00%	11	41.82%	23	32.73%	18	55
										<b>Answered</b>	<b>55</b>
										<b>Skipped</b>	<b>0</b>

Source: Created by author



**Figure 8: Impact of companies' supply chain on customers**



Source: Created by author

Again, correlation coefficient is also computed for this variable in order to further analyse and determine which variable in this group has the strongest correlation with company's competitiveness, as these variables tend to have impact on customers.

**Table 8a: Pearson's r correlation coefficient for factors which impact customers in companies' supply chain;**

	Commitment and Understanding of SCM	Continuous improvement of supply chain	Focus on customer requirement	Effective control of supply chain management
Commitment and Understanding of SCM policy	1			
Continuous improvement of supply chain mgt	0.912185532	1		
Focus on customer requirement	0.744573056	0.945264939	1	
Effective control of supply chain management	0.889015067	0.979069421	0.948978798	1

Source: Author

The **Pearson's** correlation coefficient in the table above shows that there is a strong relationship between all the variables listed above. However, there is a stronger correlation between effective control of supply chain management and continuous improvement of supply chain, which means that when companies are keen on having the effective control of supply chain management and continuously improve in supply chain, there is going to be tremendous growth and subsequently attain a high competitive advantage. Therefore the main factors in this group that correlate with competitive advantage are *effective control of supply chain management* and *continuous*

*improvement of supply chain*, hence, companies who focus on developing these areas in their supply chain will gain a high competitive advantage in the industry which they operate in.

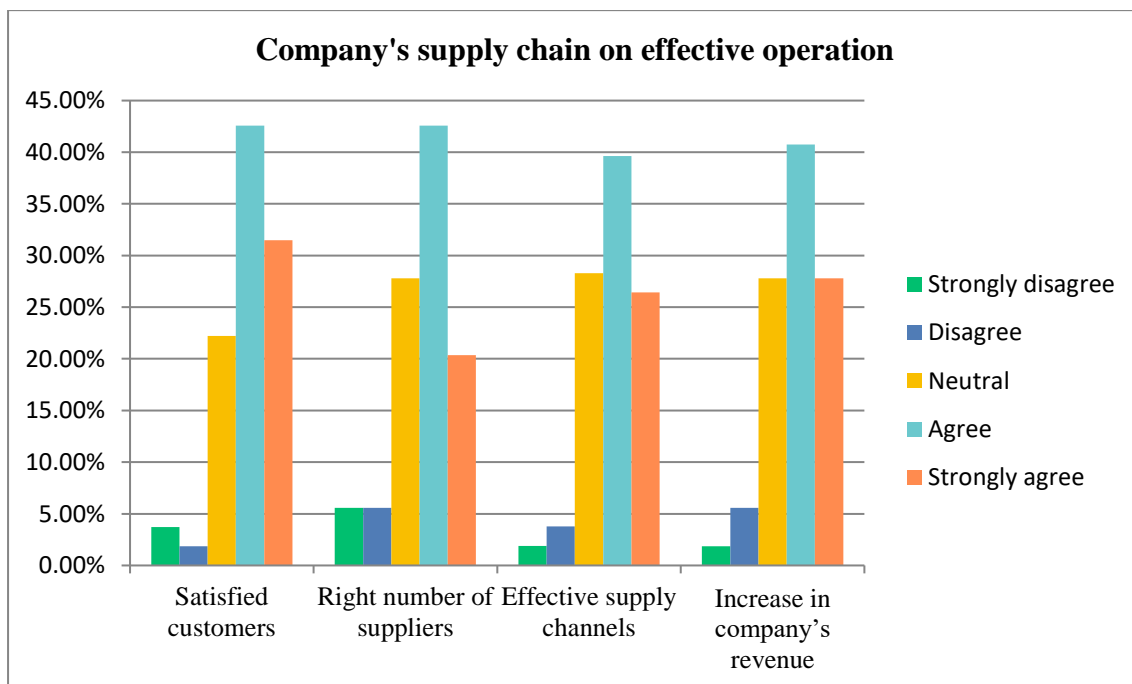
The last question on the survey was about the impact of supply chain of companies on their effective operation. Again, suggested options were provided for respondents to either agree or disagree with. Majority of respondents agreed and strongly agreed to these options. The overall majority responses agreed that their companies' *supply chain provide satisfaction to customers* and also *involves the right number of suppliers*. Each of these responses carries 42.59% responses. The summary of these responses is provided in the table and chart below.

**Table 9: Companies' supply chain on effective operation**

Company's supply chain on effective operation										
	Strongly disagree		Disagree		Neutral		Agree		Strongly agree	
Satisfied customers	3.70%	2	1.85%	1	22.22%	12	42.59%	23	31.48%	17
Right number of suppliers	5.56%	3	5.56%	3	27.78%	15	42.59%	23	20.37%	11
Effective supply channels	1.89%	1	3.77%	2	28.30%	15	39.62%	21	26.42%	14
Increase in company's revenue	1.85%	1	5.56%	3	27.78%	15	40.74%	22	27.78%	15
										<b>Answered</b>
										<b>Skipped</b>

*Source: Created by author*

**Figure 9: Companies' supply chain on effective operation**



*Source: Created by author*

To answer our research question as to whether there is a viable relationship between supply chain and companies' competitive advantage, a *Pearson's* correlations coefficient was determined using an Excel tool. Thus the above variable was used in determining this correlation coefficient. This variable was particularly chosen because it contains elements that link supply chain with companies' success which means, when companies are successful, they also have a high competitive advantage in the industry. The Pearson's r correlation coefficient was therefore calculated for this variable. Below is the result of the correlation coefficient.

**Table 10: *Pearson's r* correlation coefficient**

	<i>Satisfied customers</i>	<i>No. of suppliers</i>	<i>Effective supply chain</i>	<i>Increase in company's revenue</i>
<b>Satisfied customers</b>	1			
<b>Right number of suppliers</b>	0.929117683	1		
<b>Effective supply channels</b>	0.96874466	0.971413152	1	
<b>Increase in company's revenue</b>	0.974466847	0.966705125	0.998244352	1

*Source: Author*

The above table present the correlation coefficient between supply chain and companies' success (which determines competitive advantage). From the above result, it is clear that there is a significant relationship between Right number of suppliers, effective supply channels and companies' competitive advantage – i.e. satisfied customers and Increase in company revenues, since the correlation values are very close to 1.

### **3.2 Interpretation of Survey Results**

The survey analysis presented above gives a clear overview of companies and their respective supply chain. Based on these results, it could be said that companies nowadays have a strong tie with supply chain. In other words, supply chain has become an integral part of operation in organizations. Supply chain system is however found in large-scale organization, that is, the larger the organization, the longer the supply chain of the organization. Small-scale organizations usually have a short chain of supply such as the manufacturer, final consumer chain.

That being said, this survey results will therefore be useful in answering our research question, “*Does supply chain quality management tools have a positive impact on an organization?*” To answer this question, the last survey results analysed will be considered. First of all, let's look at the question that addressed *the impact of companies' supply chain on customers*; the respondents' answers proof that having a good or quality supply chain would create positive impacts on customers. This conclusion is based on the fact that majority of

respondents either agreed or strongly agreed to the positive impact their company supply chain has on customers.

Our final conclusion is drawn from the final question in our survey which was focused on analysing how different companies supply chains contribute to their effective operation. The results show that a quality supply chain actually has a huge positive impact on companies operation, in other words, it helps companies to operate effectively in their respective markets. Again, the responses gotten from survey participants show a huge number of participants agreeing and strongly agreeing to supply chain creating satisfied customers in their organizations, as well as increasing company's revenue. What this means is that when customers are satisfied, they will act as motivators for the organizations, which in turn will help companies to grow, enlarge their networks as well as act effectively in the market in which they belong. And also, when a company's revenue is on the increase, it means that the company will constantly have a steady growth, which of course will result in effective operation.

Finally, the *Pearson's r* correlation coefficient thus helps to answer our research question and to determine if there is a significant relationship between supply chain quality management and competitive advantage in companies. The result shows that there is in fact a significant relationship between the two variables, and it could also be said that supply chain quality management tools have a positive impact on an organization.

### **3.3 Analysis of Interview Responses**

Responses from interview were written down during the interview, although some interview were conducted via Skype and responses were written down during the interview, the interviewee responded to the questions explicitly and a conclusion was drawn at the end of the interview. The interview consists of 13 questions constructed from the theoretical analysis. Five (5) experts were collected for this interview. These experts were contacted prior to when author conducted the interviews and time and place for the interview was scheduled based on the interviewees availability. The interview style was structured, that is, author had drafted the interview questions in order to be specific on the questions and to be able to administer the same to all interviewees.

For the purpose of confidentiality, and as agreed between the author and interview respondents, the names and organizations of respondents are not mentioned. Thus, respondents will be addressed as Respondent 1, 2, 3,4 and 5, while respondents' organizations will be addressed as 'the company'. The responses from the interview will aid to understand the influence

in which supply chain management elements have on organizations; hence proving an answer to the research question stated above. The respondents' responses is therefore analysed below.

**Question 1: How does commitment to quality influence company's competitive advantage?**

**Resp. 1:** Respondent was quick to mention that if companies are not effective in what they are doing or don't know how to run their business, they will end up in huge debt and go bankrupt eventually folding up, he further stated that whether organizations are committed or not to quality in it process, it just a matter of time

**Resp. 2:** Respondent didn't agree with the question, he rather said that committing to quality will not make an organization a leader in the market

**Resp. 3:** According to this respondent, commitment to quality has no influence on organization advantage, if companies are not committed to their products or services but satisfies the customers, then why is it needed

**Resp. 4:** Committing to quality won't determine process, it could assist to some percentage but it won't really be a deciding factor for competitive advantage

**Resp. 5:** Quality commitment don't always determine process, it could assist to some amount but it won't really be a deciding factor to competitive advantage

**Question 2: How does customer satisfaction and definition Influence Company's competitive advantage?**

**Resp. 1:** Respondent explained that if customers are not satisfied, then it means something is wrong somewhere and needed to be fixed,

**Resp. 2:** Respondent 2 asserted that if customers are happy, company will also be happy and process will be smoother

**Resp. 3:** According to 3<sup>rd</sup> respondent, when problems are prevented they always save cost for the organizations, it is better to prevent it than to let it happen and cause more damages to the organization

**Resp. 4:** As asserted by this respondent, the main point is for customer to be satisfied; this will tell you that you are doing well

**Resp. 5:** This respondent explained that, some organizations are more about the profit which they want to make, whereas for his organization, he asserted that customers' satisfaction is prior to profit.

**Question 3: How do defect preventions influence company's competitive advantage?**

**Resp. 1:** Respondent explained that when defects are prevented, it leads to more profit and less cost of paying for damages, which of course gives organization a stronger position in the market.

**Resp. 2:** According to this respondent, his company plans to implement measures that would prevent defect, however, he doesn't believe that preventing defect from occurring actually influences competitive advantage

**Resp. 3:** Respondent 3 asserted that when defects are prevented in the supply chain, it will lead to preventing some or most of the abnormalities the company might tend to face, therefore, this leads to saving cost for the organizations, it is better to prevent it that to let it happen and cause more damages to the organization

**Resp. 4:** Respondent 4 believes that if products are prevented from damaging, then company is on the verge of saving a lot of cost

**Resp. 5:** Same goes with respondent 5, if you can prevent it from damaging or going bad, you will save cost, save labour as well.

**Question 4: How does effective communication influence company's competitive advantage?**

**Resp. 1:** Respondent stated that if communications are going smooth, they won't be any room for problems during the process of supply chain

**Resp. 2:** According to this respondent, smooth communication reduces places for errors, so this will help companies a lot on staying top

**Resp. 3:** Through effective communications, companies could read other supply chain process which will enable them function properly

**Resp. 4:** When there is effectiveness in everything you do, in most cases you succeed and growth, which also applies to the rules of doing business

**Resp. 5:** It enables information flows goes well, they won't be any form of miscommunication and so process will be smoother for organization

**Question 5: How does quality measurement influence company's competitive advantages?**

**Resp. 1:** Respondent didn't agree on measurement of quality, he further states that quality shows when you are doing good with your products or services but also disagrees on measuring it

**Resp. 2:** Respondent disagreed on measurement of quality that is either good or bad

**Resp. 3:** This respondent sounded like most of other respondents, they stated that quality measurement wasn't to be understood, that quality is either there or not, but he further states that although terms like low quality exist but that not how to measure

**Resp. 4:** Even if the quality is measured, what will be done? Asked respondent 4, he believes that the most crucial thing is to have quality and not measure it

**Resp. 5:** Quality measurement doesn't always influence competitive advantage, it not a process of improvement or development but it is just to know the level of how you are going

**Question 6: How does identification of root cause of problem influence company's competitive advantage?**

**Resp. 1:** According to this respondent, if problems are identified, they could be prevented from happening in the future

**Resp. 2:** According to this respondent, when a company knows the root cause of any problem, it can easily find the solution but with no knowledge of the root cause problem, that problem will persist which will subsequently cause things to go wrong

**Resp. 3:** If they can identify a problem, they are half way to solving it, so it is very necessary for every organization,

**Resp. 4:** When organizations cannot identify their problems then it is open to say that they will have a lot of problem sooner or later but the case will be different if they can, they know the main cause of the problem, and the solution will come later on.

**Resp. 5:** In life, once you can identify the cause of a problem, you can prevent it from happening and also fixed what has happened

**Question 7: How does employees training and inclusion Influence Company's competitive advantage?**

**Resp. 1:** Respondent is aware of training of employee but answers are based on the field of operation, and example could be that of a delivery company, the driver knows routine and it doesn't change, so they won't be any need for trainings

**Resp. 2:** Once employees are included, they always have this mind of freedom and want to put in their best effort

**Resp. 3:** when employees are trained more, they get new information's about how to effective deliver their services,

**Resp. 4:** If employees are trained, they will be kept up to date on what they are doing, they will know the trend to follow and will understand the room for improvements

**Resp. 5:** To train employees will take almost nothing from the company but it will create and developed employees with abilities and help those who are having issues

#### **Question 8: How does a Recognition scheme influence company competitive advantages?**

**Resp. 1:** Respondent almost didn't know how to answer the question, therefore giving explanations that didn't relate to the questions, although he mentioned that schemes in supply chain does not have any influence in companies competitive advantage.

**Resp. 2:** If the schemes are recognised by company and its employees, they won't be told what to do and what not to do

**Resp. 3:** Understanding what the recognition scheme was an issue, but after further clarifications respondent was quick to disagree with question, and states that if scheme is not useful or effective, it should be changed

**Resp. 4:** Company don't always recognise their schemes, they want to make sure that anything that will give them a competitive advantage is welcomed but not recognition of scheme,

**Resp. 5:** Company tend to recognise their scheme

#### **Question 9: How does continual improvement and benchmarking Influence Company's competitive advantage?**



**Resp. 1:** He state that as the name of the question implies, companies are not to be told to continually improve on their product and services, it should be compulsory to enable company lead in the market

**Resp. 2:** When organizations are continually growing they don't need to worry about other competitors, so these elements are very advisable for organizations

**Resp. 3:** When there is continual improvement, they is less room for competitors because organization will always be ahead

**Resp. 4:** When there is continuity on whatever you are doing in live, you always want to continue especially if it doing you so many good and bringing growth

**Resp. 5:** When there is continual improvement, there is more chance for you to always be ahead and little worries from competitors

**Question 10: How does commitments and understanding from employees Influence Company's competitive advantage?**

**Resp. 1:** If employees are committed and they do their job with their hearts, it makes work flow easily in the sense that they will enjoy the atmosphere and do their job diligently

**Resp. 2:** If employees understand the process properly, and are committed to what they do, therefore productions will be influenced and if they, and effectiveness will be attained

**Resp. 3:** If employees are committed to what they are doing, they do it with diligence and more effectively,

**Resp. 4:** If they are committed, handling customers and other task will be a bonus

**Resp. 5:** I don't think it will directly influence company competitive advantage but it will have some impacts although not very much

**Question 11: How does quality improvement culture influence company's competitive advantage?**

**Resp. 1:** Culture is a core aspect of every organization; this will help the organization operate based on a specific structure, and would subsequently contribute to the organizational success

**Resp. 2:** Organizations have to have a culture or rather say, a way of steadily improving

**Resp. 3:** When quality is been improved, product/ services stay up to date and this will lead to customers staying

**Resp.4:** If it is in the culture of the organization to improve, they will get used to growing and getting better

**Resp. 5:** Companies need to have an improvement culture and every time there is improvement in the company there is a new customer

**Question 12: How does continuous improvement in process influence competitive advantage?**

**Resp. 1:** Once company shuts down the room for continues improvement, they tend to leave the top stop in a short while and to regain it position don't seems possible in a short time.

**Resp. 2:** Remaining at a status quo, knowing and doing the same thing will subject companies to stagnation, so having a continuous improvement strategy is key to continuous growth and sustainability.

**Resp. 3:** Once the process is continual and the improvement is continual, they intend to stay always ahead of others, they know when to makes changes.

**Resp. 4:** As the process goes on, so the growth should follow suits he stated.

**Resp. 5:** There is no need to stop improving when you are ahead in the market; you need to have a continuous process to continually be ahead.

**Question 13: How does focus on customer requirement influence company's competitive advantage?**

**Resp. 1:** Respondent was keen on company's requirement and not on customers requirement for example, shipping between Lithuania and Germany take DHL 2-5 working days, that is their requirement and it won't need the opinion of the customers to change it. These questions were denied during the interview

**Resp. 2:** Respondent was quick to deny it, stating that customers requirement are not really necessary, these questions were denied during the interview; interviewer asked if the question made little or no influence, interviewee stated assertively that is made no influence

**Resp. 3:** Most companies have strict rules for their business, so focusing on what the customer want could be an advantage for the company, especially to make profit from it but they could also add quality. Interviewer stated that questions made little or no influence, interviewee agreed strongly with question

**Resp.4:** We cannot be focusing on customers' requirement mostly, some of our processes are needed to be followed, it is like a hospital, and the doctor gives you medicine that is going to make you feel better and not the patient dictating for the doctor.

**Resp. 5:** Our organization does not really focus on customers' requirements, they focus on making our process more efficient and effective for us, to enable us make quality product with less amount of money, also the following were agreed by interviewee

### 3.4 Interpretation of Interview Results (Qualitative Analysis)

Results from responses will be explained into 3 categories, questions with variables that are considered by interviewees as crucial to quality supply chain and would give organizations a competitive edge in the industry (positive views, P), questions with variables which interviewees consider as not very crucial to improving the supply chain and thus do not determine the competitive advantage of companies in the industry (negative views, N), as well as questions with variables which have both views according to different respondents (positive/negative views, P/N). The analyses of these questions are presented below.

**Table 11: Questions with positive responses**

No of Q, Questions	Response
(#2.) How does customer satisfaction and definition influence company's competitive advantage?	P
(#4.) How does effective communication influence company's competitive advantage?	P
(#6.) How does identification of root cause of problem influence company's competitive advantage?	P
(#9.) How does continual improvement and benchmarking influence company's competitive advantage?	P
(#11.) How does quality improvement culture influence company's competitive advantage?	P
(#12.) How does continuous improvement in process influence competitive advantage?	P

*Source: Created by Author*

For the above listed questions, all of the interviewees were positive about in the sense that they recognize that these variables are needed in order to give them a competitive advantage in the market in which they operate in. For instance, interviewees emphasized that customer satisfaction is key to maintaining growth and quality in a company's supply chain. Also, interviewees stated that having a smooth and constant communication in the supply chain is key to having a smooth and effective relationship at any and every stage of its operation, and thus create room for growth and dominance in the market. Identifying root causes of defection or any sort of abnormality in a company's supply chain was also noted by interviewees as an important aspect for all companies to consider, as this would prevent the company from experiencing any sort of shortfall in the future. Furthermore, interviewees see improvement culture and organizational culture in general as part of organization which is crucial to maintaining growth and reaching its potential. As mentioned by the interviewees, if companies have an improvement culture, it will help them grow steadily, have a smooth supply chain relation and as well attract new customers, making them outstanding in the market and gain a competitive advantage over other companies. Finally, interviewees asserted that continuous improvement at every stage of company operation gives room for companies to stay at the top, that is, reaching for new innovation, expanding horizon, incorporating new strategies into company's supply chain management is important for the growth of every company, and therefore will give companies a competitive advantage in the industry.

**Table 12: Questions with Negative responses**

<b>(#1) How does commitment to quality influence company's competitive advantage?</b>	<b>N</b>
<b>(#5) How does quality measurement influence company's competitive advantages?</b>	<b>N</b>
<b>(#13) How does focus on customer requirement influence company's competitive advantage?</b>	<b>N</b>

*Source: Created by Author*

The above listed interview questions were responded negatively to by all interviewers. That is, the interviewers' responses could mean that these variables are not crucial and are not capable of contributing to company's growth as well as give them competitive advantage over other companies. For instance, respondents believe and asserted that it is more important for companies to ensure that they have quality in their supply chain, because they added, only measuring quality

will not improve anything, but rather working on improving quality is crucial. Also, an interviewee added that quality measurement is not a guarantee for reaching a competitive edge in the industry. Furthermore, interviewees made it clear from their responses that companies should focus more on making their processes right, and making sure that they give the best to customers, and not focusing on what customers require. Interviewees believe that it is better for companies to focus on making their processes effective and efficient to provide satisfaction to customers. Thus, they added, that customer requirements are not an important aspect for giving company a competitive advantage in the industry.

**Table 13: Questions with Positive/Negative responses**

	<b>Responses</b>
<b>(#3.) How does defect preventions influence company’s competitive advantage?</b>	<b>P/N</b>
<b>(#7.) How does employees training and inclusion influence company’s competitive advantage?</b>	<b>P/N</b>
<b>(#8.) How does a Recognition scheme influence company competitive advantages?</b>	<b>P/N</b>
<b>(#10.) How does commitments and understanding from employees influence company competitive advantage?</b>	<b>P/N</b>

*Source: Created by Author*

During the interview, the above listed questions had different opinions from the respondents, for instance, question #3 on whether or not defect preventions in the supply chain influence company’s competitive, all but only respondent 2 asserted that defect prevention in a supply chain could result in cutting down cost for company and eventually make company gain a competitive advantage over other company in the industry. Respondent 2 however stated that defect prevention is good for companies, but doesn’t think that this can cause companies to have any kind of competitive advantage. Therefore, the ratio could be presented as 4:1, where four respondents believe that this variable is good for company when properly managed in the supply chain. Looking at question #7 which is on whether or not employees training and inclusion has any influence on company’s competitive advantage, there were also conflicting responses from interviewees, 3 respondents asserted that training of employees is important for effectiveness because employees will gain the necessary knowledge and skills, and thus gain self-development which will make them productive, and thus, create value in company’s supply chain. However, 2 respondents do not see the need for training employees, they assume that employees have all the skills required and training them will add no extra value to them or company’s supply chain, and

thus does not have any impact on organization's competitive advantage. For this variable, there is a ratio of 3:2, that is, 3 responses assert that this variable is necessary for organization.

Another question for variable with a conflicting responses is question #8 on whether or not recognition scheme influences company's competitive advantage, just one respondent see the need for scheme recognition in company's supply chain, whereas, 4 respondents stated that recognition of scheme is not important in companies' supply chain and thus has no impact on their competitive advantage. For this variable, the ratio is 1:4, where only one respondent asserted that recognition scheme is needed for companies and four do not this so. Finally, question #10 assesses whether or not commitment and understanding from employees influence companies' competitive advantage. The responses also show a conflicting view from the respondents where 4 respondents (Resp. 1, 2, 3, & 4) asserted that there is need for company to have its employees understanding and commitment, as this would increase productivity and effective in companies' supply chain and thus increase companies' competitive advantage. Respondent 5 on the other hand asserted otherwise, stating that employees understanding and commitment have no influence on company's competitive advantage.

## CONCLUSIONS

This study addresses a relevant topic in today's world of business – the supply chain quality management. Study is sectioned into three main part addressing the conceptual framework, the methodology of research and the empirical analysis of research. Thus, the following conclusions are drawn from this study according the objectives.

- I. The study provides an understanding of SCQM as a concept which is required by every company as it provides company with the right customer service, thus ensuring that company's product and services are provided to consumers in the right quantity and on a timely basis. There are various benefits which this concept provides to company which integrates it into it supply chain mechanism, some of the benefits include, knowing what customer wants, finding roots causes and proving solution and as well as preventing future occurrences, also, this study finds that Supply chain quality management is very beneficial to companies as it provides them with the ease of communication with suppliers as well as consumers. Effective communication of customers' preferences or complaints provides companies with the insight to what product is most needed by consumers, how those products are rather preferred and what to avoid while producing those products, hence, companies experience ease of production of products which also creates efficiency in the cost of producing those products.
- II. From the empirical research carried out in this study, it is clear from the responses that SCQM is very effective in companies as many respondents agree that supply chain provides companies with effective operation. From the responses of survey participants, supplier chain provides satisfaction to customers as quality management of supply chain allows the right number of suppliers in the supply chain, and most of all, creates an effective supply channels for the company. Moreover, from the interview carried out in this study to find out more details(effective communications network between one supplier to final destination, the identification of root causes) about the effectiveness of SCQM, the responses gotten from the interviewees stated that SCQM provides positive impacts on organizations.
- III. The study also shows that SCQM provides company with a high level of competitive advantage which include providing company an effective communication channel between suppliers as well as consumers. Company gets to know consumers preferences with ease as communication takes place in every stage of the supply chain and the transfer of information is done swiftly from one stage of the supply chain to another which makes if reach company on a timely basis.

- IV. A Pearson's r correlation coefficient was computed using variables from the survey. This was mainly to determine the correlating factors in a company's supply chain with company's competitive advantage. There was a strong correlation in all of the tested variables, which therefore means that these factors determine company's competitive advantage.
- V. An interview was carried out basically to determine the measures/variables in the supply chain that could provide companies with competitive advantage over other companies in the industry. The interview was carried out with 5 experts from different service provider companies (*name of interviewees and companies withheld for the purpose of confidentiality and as agreed between author and interviewees*) in a structured manner. The responses gotten strongly imply that variables such as customer satisfaction, effective communication across the supply chain, identification of root causes, continual improvement and benchmarking, quality improvement culture as well as continuous improvement in process in companies' supply chain have a great impact on companies' supply chain and thus can increase companies' competitive advantage if properly managed.
- VI. Furthermore, variables such as quality measurement and focus on customer requirement even though they are needed in companies, they are not really crucial in the supply chain and do not have any sort of impact on companies' competitive advantage. Experts believe that it is much more important for organizations to focus on how to increase quality rather than on measuring quality. Again, they believe that is crucial for companies to follow process in order to provide quality service and gain customer satisfaction rather than seeking customer requirement. Lastly, the interview variables such as defect prevention, employees training and inclusion, recognition scheme as well as commitments and understanding from employees are influencing factors on companies' supply chain, even though these were not agreed upon by all respondents. These variables are noted as variables with conflicting views by interviewees.



## RECOMMENDATIONS

The aim of every scientific study is not only to reach a goal and solve a problem; it also involves developing a new idea or making a proposal of how to further improve the situation or prevent a problem from reoccurring. Therefore, some proposals will be made based on this study in order to help future researchers in further research as well as help organizations whether small or large-scale to create a proper and stronger organization.

- I. Firstly, for organizations to remain relevant and gain a competitive edge in the market, it must adopt the means which will aid it achieve this aim. Having a successful supply chain is one of the means in which a company can gain a competitive advantage in its sphere of business.
- II. Organizations which are using the supply chain ought to not only focus on the benefits but also should be aware of the challenges in order to be able to manage it effectively.
- III. Companies ought to understand the various processes and models and apply them accordingly in order to get the best out of its supply chain.
- IV. Every organization should understand and recognize the need to have an integrated form of operation in the market. Nowadays, companies do not directly compete with one another; the competition is now based on supply chain. The more effective, the one supply chain is, the more effective it will be in term of operation.
- V. Organizations which are using the supply chain ought not to only focus on the benefits but also should be aware of the challenges in order to be able to manage it effectively.
- VI. Finally, companies ought to understand the various processes and models and apply them accordingly in order to get the best out of its supply chain.

## **SUMMARY**

Chukwuebuka Franc Nebeolisah

### **INFLUENCE OF SUPPLY CHAIN QUALITY MANAGEMENT TO COMPETITIVE ADVANTAGE**

Master Thesis

Academic supervisor: Prof. dr. Dalius Serafinas

Vilnius University, Faculty of Economics and Business Administration

Quality Management

Vilnius, 2019

Size: 78 pages, 9 figures, 13 tables, 2 appendixes, 56 references

The aim of this master's thesis is to define how supply chain quality management could give a competitive advantage over other competitors. The objectives for this aim include to analyse the concept of supply chain quality managements; to investigate how the concepts is beneficial to organizations in terms of ease of production and cost efficiency; to carryout empirical research on the effects of supply chain quality management on companies, to evaluate the impact of supply chain quality management on companies' competitive advantage. The study is made up of three main parts (chapters). The first chapter presents the theoretical framework of supply chain quality management encompassing the review of past literature; the second chapter presents the methodology employed in research and the last chapter presents empirical analysis and results of research.

Both quantitative (survey) and qualitative (interviews) analysis were conducted in this study. The survey comprised of 10 questions which were a mixed of option based and Likert scale questions, where 8 of these questions were analysed in this study. The results and analysis of the survey was helpful in answering to the research question drawn in this study. To determine this, a Pearson's r correlation coefficient was computed and the result shows that there is in fact a viable relationship between these variables. The Interview was conducted with experts from different service providers companies. The interview comprised of 13 structured questions administered to five experts. The focus of the interview was based on 13 elements that are considered as influencing factors for companies' growth and competitiveness. The responses from experts show that 6 out of the 13 elements were asserted by experts as key elements for every company, as these are important in companies' supply chain and to aid company gain competitive advantage.

Three of the elements are seen as not very crucial for companies to gain competitiveness, and four of the elements have conflicting views, that is, some experts believe that they are crucial for companies to have a quality supply chain and gain competitive advantage, while other experts thought otherwise. Conclusively, this study has been able to answer to present the various factors influencing supply chain quality management and to proof that there is a significant relationship between supply chain quality management and competitive advantage.

**Keywords:** Quality Management, Supply Chain, Influence, Competitive advantage, Organizations

## SANTRAUKA

Chukwuebuka Franc Nebeolisah

### KOKYBĖS VALDYMO ĮTAKA TIEKIMO GRANDINĖS KONKURENCINIAM PRANAŠUMUI

Baigiamasis magistras

Vadovas: Prof.dr. Dalius Serafinas

Vilniaus universitetas, Ekonomikos ir verslo administravimo fakultetas

Kokybės vadybos magistro programa

Vilnius, 2019 m

Dydis: 78 puslapiai, 9 paveikslai, 13 lentelių, 2 priedai, 56 nuorodos

Šio magistro darbo tikslas - nustatyti, kaip tiekimo grandinės kokybės valdymas galėtų suteikti konkurencinį pranašumą prieš kitus konkurentus. Šiuo tikslu buvo analizuota tiekimo grandinės kokybės valdymo koncepcija, iširta, kaip šios koncepcijos yra naudingos organizacijoms gamybos gerinimo ir ekonomiškumo požiūriu; atlikti empiriniai tyrimai skirti įvertinti tiekimo grandinės kokybės valdymo poveikį įmonėms, įvertinti tiekimo grandinės kokybės valdymo poveikį įmonių konkurenciniam pranašumui.

Tyrimą sudaro trys pagrindinės dalys (skyriai). Pirmajame skyriuje pateikiama teorinis tiekimo grandinės kokybės valdymo pagrindimas; antrajame skyriuje pristatoma mokslinių tyrimų metodologija ir paskutiniame skyriuje pateikiama empirinė analizė ir tyrimų rezultatai.

Šiame tyrime atlikta tiek kiekybinė (apklausa), tiek kokybinė (interviu) analizė. Apklausa susideda iš 10 klausimų, dalis klausimų turėjo ir pasirinkimų variantus ir dalis jų turėjo Likerto skalę (8 iš šių klausimų).

Tyrimo rezultatai ir analizė buvo naudojami atsakant į šiame tyrime pateiktą tyrimo, ar yra ryšys tarp tiekimo grandinės kokybės valdymo ir konkurencinio pranašumo įmonėse. Tam nustatyti buvo apskaičiuotas Pearson'o r koreliacijos koeficientas ir rezultatas parodė, kad iš tikrųjų egzistuoja ryšys tarp kai kurių kintamųjų. Interviu vyko su įvairių paslaugų teikėjų įmonių ekspertais. Interviu sudarė 13 struktūrizuotų klausimų, į kuriuos atsakė penki ekspertai. Interviu dėmesys buvo sutelktas į 13 elementų, kurie laikomi įtakojančiais įmonių augimo ir konkurencingumo veiksniais. Ekspertų atsakymai rodo, kad iš 13 elementų 6 elementai buvo patvirtinti kaip svarbūs įmonių tiekimo grandinėje ir padeda įmonei įgyti konkurencinį pranašumą.

Trys elementai laikomi ne itin svarbiais, kad įmonės įgytų konkurencingumą, o dėl keturių element ekspertai turiprieštarinę nuomonę. Galima daryti apibendrintą išvadą, kad yra ryšys tarp tiekimo grandinės kokybės valdymo ir konkurencinio pranašumo.

Raktiniai žodžiai: kokybės valdymas, tiekimo grandinė, įtaka, konkurencinis pranašumas, organizacijos.

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## APPENDIXES

### Appendix I: Survey Questionnaire

Dear Respondents!

My name is Franc Nebeolisah. I am a full time master's student of Vilnius University studying quality management; I am conducting a survey on supply chain quality management. This survey is for Research Project 2. The goal is to gather data from respondents. Your answers will help me know the impact of quality in supply chain system in companies. There are few simple questions that will take about 3 minutes to answer and all responses will remain strictly confidential.

Please specify your email if you want to get results from data collected.

#### 1. How long have you been working with your company?

- Less than 1 year
- 1 - 3 years
- 6 years
- 7 years and above

#### 2. Employees Position in the organization

- CEO, Managing Director,
- Head of Logistics,
- Sales Manager
- Other (please specify)

#### 3. How long has your organization been in business?

- Under 1 year
- 1 - 4 years
- 5 - 10 years
- 11 years and above

#### 4. Number of Employees working in your company

- Less than 50 employees
- 51 - 150 employees
- 151 - 250 employees

#### 5. Line of Products (Main activity of the organization)

- Food and AgroBiz,
- Furniture,

- Electronics
- Other ...

**6. How does the supply chain system of your company looks like?**

- Supplier - Manufacturer – Consumer
- Supplier - Manufacturer - Wholesaler – Consumer
- Supplier - Manufacturer - Retailer – Consumer

**7. On a scale of 1 (not efficient) to 5 (very efficient), how would you rate the efficiency of your company's supply chain?**

1 2 3 4 5

Not efficient  Very efficient

**8. From the list below, choose the option that best describes the quality of your company's supply chain system.**

Strongly Disagree Disagree Neutral Agree Strongly Agree

Company has a quality supply chain system

Company's supply chain system is good but not the best

**9. From the options below, what would you say is the impact of your company's supply chain on customer?**

- Commitment and Understanding of supply chain management policy has a positive impact on customer  
1. Strongly disagree 2. Disagree 3. Neutral 4. Agree 5. Strongly agree
- Continuous improvement of supply chain managements has a positive impact on customer  
1. Strongly disagree 2. Disagree 3. Neutral 4. Agree 5. Strongly agree
- Focus on customer requirements has a positive impact on customer  
1. Strongly disagree 2. Disagree 3. Neutral 4. Agree 5. Strongly agree
- Effective control of supply chain managements has a positive impact on customer  
1. Strongly disagree 2. Disagree 3. Neutral 4. Agree 5. Strongly agree
- .... Other???

**10. from the options below, please choose how you would rate your company's supply chain on effective operation.**

- Satisfied customers
- Right number of suppliers
- Effective supply channels
- Increase in company's revenue

## **Appendix II: Structured Interview Questions**

Questions for interview were developed considering the theoretical parts, appointments were made with 10 respondents in Nigeria and Lithuania. Interview time is between 30- 50 minutes.

- 1. How does commitment to quality influence companies' competitive advantage?**
- 2. How does customer satisfaction and definition influence companies' competitive advantage?**
- 3. How do defect preventions influence companies' competitive advantage?**
- 4. How does effective communication influence companies' competitive advantage?**
- 5. How does quality measurement influence company's competitive advantages?**
- 6. How does identification of root cause of problem influence companies' competitive advantage?**
- 7. How does employee training and inclusion influence companies' competitive advantage?**
- 8. How does a Recognition scheme influence company competitive advantages?**
- 9. How does continual improvement and benchmarking influence company competitive advantage?**
- 10. How do commitments and understanding from employees influence company competitive advantage?**
- 11. How does quality improvement culture influence company competitive advantage?**
- 12. How does continuous improvement in process influence competitive advantage?**
- 13. How does focus on customer requirements influence competitive advantage?**