

**LEAN SUPPLY CHAIN MANAGEMENT AND OPERATIONAL
PERFORMANCE OF ALMASI BEVERAGES COMPANY
LIMITED**

BY:

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DECLARATION

This research project is my original work and has not been presented to any other institution of learning for the award of an academic certificate.

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D61/72362/2011

This research project has been submitted for examination with my approval as the student supervisor.

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DEDICATION

I thank God Almighty for having given me wisdom and strength to see me through this project to its very end. This project is dedicated to my family for their support and encouragement. I wish to thank all my friends and mentors who encouraged me while I was undertaking this project.

ACRONYMS AND ABBREVIATIONS

ABL-	Almasi Beverages Company Limited
ERP-	Enterprise resource program
ICDC-	Industrial and Commercial Development Corporation
ICT-	Information Communication Technology
JIT-	Just In time
OE-	Operational Excellence
OTIF-	On time in full
SCM-	Supply Chain Management
TPS-	Toyota production system
TQM-	Total Quality Management

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ABSTRACT

Lean is coordinated approach to increasing value to the customers by identifying and reducing wastes of time and material through kaizen processes and initiatives guided by a pull process from the customer. The purpose of this study was to establish the effect of lean supply chain management on operational performance of Almasi Beverages Company Limited, Kenya. The research methodology adopted was longitudinal case study with Almasi Beverages Company Limited as the unit of study. Data was collected by use of interview guides analyzed through content analysis, descriptive and inferential statistics. The research findings were that Almasi Beverages Company Limited had moderately implemented lean supply chain practices in all areas of its functions. The effect of lean practices and concept on operational performance in the organization was cited as generally positive. Most of the leaks in the processes had been sealed off and wastes reduced resulting to improved operational performance in most functions in the business. The main drivers of lean supply chain adoption at the organization were cited as managing wastes to be more efficient, high costs of raw materials and competition from other industry players. Benefits from lean implementation included improved efficiencies across the supply chain, improved housekeeping in the plant and standardization of processes and procedures supported with a new ERP. The major challenge that faces Almasi Beverages Company Ltd is general resistance to culture change and adoption of new ways of doing things by employees both junior and senior staff and heavy capital investments in the ERP and automation of supply chain processes to achieve standardization and efficiencies. In summary, application of lean supply chain has not been completely adopted at Almasi Beverages Company Limited as they continue to struggle in some areas and as such it has not realized the maximum gains of lean supply chain practices. Drawing from the findings of the study therefore it is recommended that Almasi Beverages Company Limited completely adopts lean supply chain practices to maximize the gains. The findings should also be learning to other beverage industries in Kenya and by extension the manufacturing industry at large. It is further recommended that future researchers should try to assess the effect of lean supply chain on operational performance and quality of customer service in the Beverage industry in Kenya. Lean implementation in the county Governments can also be evaluated in future studies

CHAPTER ONE: INTRODUCTION

1.1 Background of the Study

Manufacturing firms and organizations face different challenges ranging from management of operational costs, overheads, utilities and wastes so as they try to improve their operational performance. The business environment has become turbulent and unpredictable that organizations that remain competitive and profitable have had to adopt lean supply chain philosophies and concepts like Kaizen, Operational excellence, Total Quality Management practices, waste management, lean production, Lean procurement and Just In Time (JIT) deliveries. These concepts and practices have led to improvements in Operations performance and strategic gains in the manufacturing and service sector as noted by Openda (2013). Lean supply chain application and culture addresses the issues of inefficiencies and wastes in business operations and how to minimize them as noted by Womack and Jones (2003). Given the external environment is not under direct influence and control of a business leadership, they must strive to manage the internal business processes so as to ensure there are no wastes, inefficiencies and cost overruns that could plunge the business into losses and possible collapse (Womack and Jones, 2003). In supply chain management, lean can be extended to logistics management where the focus will be on managing and scrapping wastes from within and outside the business through reduction of excess inventory and mapping economic re-order level quantities. Lean supply chains is based on actual demand and not push philosophy (Jaskanwal, Deep and Rajdeep, 2013).

According to Borac et al., (2010) supply chain tends to accumulate wastes and activities that do not add value for various reasons, both internal to the business and also due to external factors. He further noted that regaining lean supply chain efficiencies may mean addressing many of the same issues that created the problems of extra and unnecessary time, inventory and costs.

Lean supply chain according Goldratt et al. (1992) is anchored on the theory of constraints and systems theory. The theory of constraints takes a scientific approach in improving processes. It hypothesizes that every complex system in the supply chain consists of multiple linked activities, one of which acts as a constraint upon the entire system. Systems theory talks about design, developing of systems and how they work in unity. These theories are both systematic methods for improving operational performance of an organization.

Almasi Beverages company limited (ABL) had been faced with inefficiencies in their business processes, wastes and high overhead costs and utility bills for several years and although their topline had been growing, the bottom-line did not seem aligned to the business strategy arising from high manufacturing costs, distribution costs and cost of sales. Their sales volume grew in the year 2012/2013 by 11% and 2013/2014 by 10%. This however did not reflect on the profitability because of the high operational costs and other overheads. The company recorded a profit after tax of 243 million in 2012/2013 financial year and 221 million in the year 2013/2014 with inventory write offs and provisions of over 50 million sh. This performance would not guarantee sustainability in the medium and long term.

1.1.1 Lean Supply Chain Management

According to Womack and Jones (2003), Lean is a coordinated approach to increasing value to the customers by identifying and reducing wastes of material and time through kaizen processes and initiatives guided by a pull process from the customer. that do not add value or” wastes” in business .They observed that this concept has been around for many years at least in manufacturing. It has however been applied recently in the area of supply chain and logistics. Womack and Jones further advanced the argument that lean supply chain is the modern frontier in business and especially in manufacturing organizations considering all businesses exist to grow and make profits and manage their operational costs.

Henry Ford in 1920s applied lean supply chain in the assembly-line process where he focused on quality and throughput improvement. Ford assembly existed as the one of the most advanced and efficient manufacturing lines until two executives at Toyota introduced the Toyota Production System (TPS) after visiting the facility in the 1950s.The Toyota Production System was designed and developed to improve quality and productivity and anchored in two pillars that were central to Japanese culture; one- elimination of wastes and two- respect for people.

Manufacturing organizations in Kenya are faced with resource constraints, competition both locally and globally hence the need to come up with priority inresource allocation and use by eliminating any wastage in the value chain hence the importance of lean processes as Shah and Ward (2003) observed. They observed that adoption of lean practices had a direct relationship with improvements in performance metrics and that the gains of lean practices are improvement in labor productivity and quality, reduction in waiting times and costs of production. They also argued that lean

supply chain adoption in a manufacturing organization guarantee high quality products and services that meets customer demand with minimal or no waste.

Lean is looked at as a strategic concept for gaining competitive edge and even for survival, for businesses. Increasing value and scrapping wastes is not a choice anymore for organizations. Organizations not practicing lean face stiff competition from other industry players and such can have serious ramifications on their businesses and industry in general. Even lean practitioners understand that the effort to be lean is ongoing (Jaskanwal et al, 2013).

1.1.2 Operational Performance

Operational Performance is defined by Voss et al., (1997) as the quantifiable dimension of an organization's business processes. It covers from reliability in production and rates of defects, on time delivery, production-time cycles, and cost of quality and reduction in non-conformity, productivity, and management of inventory. Elisa, et al., (2013) observed that organizations that have adopted the Total Quality Management (TQM) approach have been characterized with better performance, increased operation efficiency and better financial results at the bottom-line. He conducted extensive empirical test on various OM practices and their effects on performance. The benefits in economic performance deriving from improved efficiency in operations, waste reduction and a new shared vision for continuous improvement were observed from test carried out on JIT. Lean practices therefore have to a general positive impact on operational performance for manufacturing organizations in Kenya.

1.1.3 Almasi Beverages Company Limited

Almasi Beverages Company limited is a soft drink manufacturer in Kenya that deals with the Coca Cola brands and products. It is today over two years old having been formed from initially three different bottling plants that included Kisii Bottlers, Mount Kenya Bottlers and Rift valley bottlers all of which were started in the year 1978. The merger was conceived from a strong business case with the three Bottlers having their major shareholders as Centum and Industrial and Commercial Development Corporation (ICDC). The three bottlers operated quite independently in their own territories with little benchmarking and even business information sharing.

The business model between Coca Cola and the bottlers is such that each bottler is given a franchise that includes a business geographical territory and required to comply with Coca-Cola requirements in terms of international best practices and stringent quality parameters for products and operations processes. Kenya has a total of six bottling companies including the three Almasi plants. Almasi controls around 30% of the total Kenyan Coca-Cola market in the regions of south Nyanza and part of south Rift, the entire central and parts of northern Kenya in the area of Moyale and Marsabit and The North rift region extending all the way to Lokichogio and to the entire expansive Turkana county in the boarder of Kenya and southern Sudan. The organization focuses on increasing shareholder value by manufacturing, packaging and selling Coca-Cola products at the least cost possible by ensuring efficiency throughout its operations.

The company has integrated its operations in the three businesses units to one seamless organization by rolling out a rapid change strategy which focuses on strong distribution, manufacturing and selling and also building a strong work force. Its new

business architecture is that of centralized commercial function, devolved manufacturing and distribution, centralized finance function, human resource, information technology, procurement and risk for the purpose of creating a sharper focus, efficiency and effectiveness to enable the organization achieve a double digit growth in 2014 and beyond. It intends to achieve all this through close collaboration with Coca-Cola, the shareholders and other key stakeholders both within and outside the organization including its human resource capital. (Almasi Strategic Plan 2014-2017).

1.2 Research Problem

Lean supply chain philosophy and practice as observed by Manrodt and Vitasek, (2008) is the surest way the organizations would be able to remain competitive and carve out their niche in the turbulent world of business. From its origin in Japan, the lean philosophy has been adopted around the globe and beyond the production floor, into administration, healthcare and even governments. They further advanced the argument that for companies working to reduce their operational costs and improve operational performance, Lean supply chain approach is a must fit. According to Manrodt and Vitasek (2005), those companies must be armed with waste fighting tools such as value stream mapping, six sigma and supply chain optimization. They noted that organizations must work out a formula for lean material flow across the supply chain downstream.

Past research have focused on lean supply chain management in on specific organizations and especially big multinationals and corporates and other key industry players across the globe. Ondiek and Kisombe (2012) noted that adoption of lean

practices has a direct relationship with improvements in performance measures and that the gains of lean practices are improvement in labor productivity and quality, decrease in lead times, costs of production and operational performance measures. According to Ondiek and Kisombe (2012), the most common benefits related to lean practices are improvement in labor productivity and quality, along with reduction in customer lead time, cycle-time and production costs.

Locally, researches have been done in the Kenyan manufacturing industries in general; (Monica 2013). Her study however did not look at the effect of lean on operational performance on the manufacturing organizations. Kanjejo (2012) in his study focused on lean supply chain management practices in public universities in Kenya. His research was on public universities and he did not look at the effects of lean practices on operational performance of the institutions.

Malonza (2014) studied Lean manufacturing at Mumias Sugar Company Limited and his focus was to evaluate its effect on operational performance. His study was limited to manufacturing as a business process and did not cover the whole supply chain. It is clear past researches have concentrated on the lean supply chain practices applied in both manufacturing and service sectors in Kenya with little studies done on the effect of lean on operational performance of the organizations.

There are not much related studies on the effects of lean supply chain on operational performance in the beverage industry in Kenya. Therefore it will be necessary to investigate the effects of lean supply chain on operational performance of Almasi Beverages Company. This study therefore seeks to establish adoption of lean supply chain management and its impact on operational performance of Almasi Beverages Company. In an attempt to evaluate the impact of lean supply chain as a business

strategy in Almasi Beverages Company and how it has improved its performance and competitiveness by reducing wastes and enhancing customer value, several questions arise: To what extent has lean supply chain improved operational performance of Almasi Beverages Company? What were the areas of lean supply chain application in Almasi Beverages Company and lastly what are the drivers, benefits, challenges faced by Almasi on implementation of lean supply chain management and practices?

1.3 Research Objectives

The objective of the study is to determine the effects of lean supply chain practices on Operational performance of Almasi Beverages Company limited.

1.4 Value of the Study

The findings from this study will contribute to improving supply chain and general management decisions at Almasi Beverages Company Limited to entrench competitiveness. The study will be of specific interests to other bottlers in Kenya in trying to understand how to improve operational performance, drive profitability and gain sustainable competitive advantage through application in context the different lean supply chain philosophies. For policy makers and senior business executives, this study will be of great value on how to help an organization achieve a quick turnaround and improved operational performance by helping them find out the best lean supply chain practices relevant for improving different organizations' operational performance.

Specifically the study serves as an appraisal for lean supply chain application at Almasi by identifying successes and obstacles that might cut the dream of the drivers of change and the brainchild of the waste management practices. The research

findings will add to the body of knowledge on lean supply chain by highlighting best practices in a manufacturing or bottling set up and findings of other researchers on lean supply chain in manufacturing organizations and how it has impacted on performance and continuous improvement over time.

CHAPTER TWO: LITERATURE REVIEW

2.1 Introduction

This chapter covers literature review on the concept of lean supply chain and operational performance. It reviews the recent global and local applications of lean supply chain in various organizations and theories relating to the topic. It also covers empirical review and conceptual framework.

2.2. Theory Underlying the Study

Lean supply chain practices and theory of constraints are both systematic methods for improving operational performance of an organization and that they have been of great focus. He further advanced the argument that the theory of constraints takes a scientific approach to improvement of business processes where every complex system consists of multiple linked activities, one of which acts as a constraint upon the entire system. Goldratt et al. (1992) further noted that the main goal for most organizations is their bottom-line and that the theory of constraints provides a powerful set of tools for helping to achieve that goal including the five focusing steps which is a methodology for identifying and eliminating constraints. In the thinking processes are set of tools for analyzing and resolving problems and lastly throughput accounting which is a method for measuring performance and guiding leadership decisions. He concluded by stressing that successful integration of the theory will result to better profitability, enhanced abilities, reduced inventory, and reduced process times which in essence mean less work-in process inventory.

Systems theory also informs the study and it is the study of systems in general with the aim of making clear the principles that can be applied to all types of systems at all nesting levels in all fields of research (Bertalanffy, 1956). He further argued that theory of systems is significant and relevant to this study since lean practices are components of lean systems employed to improve processes. Systems theory can be considered a specialization of systems thinking or basically in depth scrutiny of how systems are developed interconnected and work together.

2.3 Lean Supply Chain Management Practices

Supply chain management (SCM) is the flow of goods and services and it includes the movement and storage of raw materials, work in progress finished goods from point of origin to point of consumption. This flow is interlinked and interconnected with channels in the provision of goods and services required by the end customer in a supply chain (Wallenburg, 2011).

Manrodt and Vitasek (2005) argued that lean supply chain is a waste management and efficiency concept of just producing what is needed at the least cost price and process. Although lean thinking is typically applied in manufacturing, its focus is applicable anywhere there are processes that needs to be improved including in the entire supply chain. They further observed that a lean supply chain is one that provides just what is needed, when and where it is needed .There are many areas in supply chain where wastes can occur and lean supply chain concept seeks to root out those problem areas including processes that are not value creating in the whole process and value chain.

Managing modern supply chain involves experts in production, procurement and even downstream processes like sales and distribution. These business processes are closely interconnected and requires a lot of understanding in application by operations and customer service executives to meet customer needs in a competitive business environment, (Manrodt and Vitasek, 2005).

Manrodt and Vitasek (2005) further advanced the argument that changes in operations and supply management have been truly revolutionary and the pace of progress has shown no sign of moderating. This has meant that businesses require to continuously being innovative and applying kaizen in their processes of procuring, manufacturing and even distribution of finished products from one place to another. It has required a complete paradigm shift in thinking of business leaders, application of modern concepts in the areas of information technology and complete departure from old fashioned concrete, steel and muscle mentality.

Lean initiatives can focus on the individual processes across the supply chain or the whole supply chain and looks at what needs to improve to drive efficiency across the business. Lean is a management philosophy that focuses on customer value through waste reduction and kaizen by applying lean principles, practices and techniques. When the concept of lean is applied and integrated across the entire supply chain then it is called lean supply chain (Manrodt and Vitasek (2005).

Myerson (2014) observed that lean and agile supply chain is not an option but a necessity for any organization that aspire to achieve efficiency and be competitive in the industry. He noted that in today' turbulent world of business, it is imperative that organizations operate a supply chain that is both lean and agile. A lean supply chain focuses on adding value for their customers while identifying and minimizing wastes

or any process that does not create value so as to help drive operational excellence programs in the supply chain informed by the need to continuously improve processes and systems. On the other hand it should be able to handle unpredictability and a constant stream of new products with speed and flexibility. An agile supply chain operates on the philosophy of wait and sees approach where the customer demand has to be put first, content known before the production process is started to address the demand. He recommends a hybrid type of supply chain to companies who want to be efficient and competitive in the industry (Myerson, 2014).

The philosophy underpinning the lean supply chain concept is elimination of wastes i.e. all processes and steps that do not add value. Wastes can be quantified in inventory, time and unnecessary costs. Procedures and processes that add value are those that are driving efficiency in ensuring the product or service is available to the customer. Any activity that slows down or stop the flow should be value adding down the value chain. Any process and activity touching on inventory should be transformational and value adding. Lean concept is very practicable in a business environment where customer demands are similar and predictable hence easy to plan for and execute (Barac&Milovanovic, 2006).

Toyota's first president, Fujio Cho defined waste as anything other than the minimum amount of equipment, materials, parts and workers (working time needed which are essential to production. He then went ahead to identify seven types of wastes to be eliminated from the supply chain as waste from over production-production that exceeds demand requirement. This product is produced for immediate sale and delivery to the customer hence ends up consuming space in the warehouse and yet it has consumed resources in processing. The other type of waste defined in the Toyota

system of production is waste of transportation. This involves movement of materials, parts or inventory that has no creation of value. An ideal case would be when materials or work in progress is transferred to the next work station immediately after the processing was finished on the previous station. Waiting would mean workers waiting and the machine is idle. This could happen because of inefficiencies in the line, bottlenecks or simply bad compliance or delay in transportation (Gross, John, McInnis & Kenneth 2003).

Defects or non-conformance is another type of waste identified in the Toyota system and it is defined as any product, part or workflow that does not meet quality standards and specification. In a manufacturing process it would mean re-work and this would cost money, resources, time and workers. The philosophy for Toyota here is quality at the source meaning getting it right the first instance and in case of any deviation, it is corrected immediately. Every employee is responsible for their area in terms of output and quality of work. Over processing-is also defined as a type of waste and includes further processing of a product that does not create more value and the customers may not be willing to pay more for it or recognize it as superior quality and hence it is incoherence of knowledge (also known as unused or wasted human talent) This is because knowledge and information are not available when needed.

Demand management according to Manrodt & Vitasek (2008), is the coordinating and controlling of all resources of demand so that the production system can be used efficiently and product delivered in time. In the concept of lean, it is a 'pull system' where production is demand driven. Works and production orders are initiated and products delivered only on the request of the customer. They further observed that such a system would work where data for customer required is generated from sales

and conveyed upstream in the supply chain to trigger a production order specific to the original demand without variations. They also noted that there is need for proper understanding and coordination between the supplier and the customer so that the supplier gets to understand how the materials used and processes involved contribute to the end product Structure. Therefore for a smooth flow, customers at every level in the supply must impact on the downstream demand. Demand management in the lean philosophy does not factor in forecasting and past data (Manrodt & Vitasek, 2008).

2.4 Components of Lean Supply Chain Management

Lean is a concept used to improve performance and drive efficiency in a business set up and it focuses on eliminating those activities and processes that do not increase value to the product or to the customer. A cost benefit analysis is done for each step and an activity or process to be taken must be qualified as value adding otherwise it is a waste and not necessary (Eaton, 2013).

Eaton (2013) looked at widening the scope beyond single organizations to include and integrate the whole level of players and organizations in the supply chain to achieve lean. This area looks at lean procurement, lean production and lean transportation.

2.4.1 Lean Procurement

According to Oracle (2016), many businesses have renewed their vigour and focus on doing more with less, and at how the adoption of lean processes including lean procurement would increase their efficiency and grow their bottom line. Traditionally procurement processes have been to provide raw materials and services for production when it is needed and at the least price possible. Best practice procurement concept moves beyond just contract negotiations and management and sourcing to proper

vendor engagement, evaluation and rating to integration. The benefits of applying lean processes to administrative activities like procurement is to ensure an organization just buys what it needs and when it needs it. This helps manage cash flow for other operations without tying up a lot of money in inventory.

Lean procurement adoption and practice helps the organization have a better visibility into inventory even on motion, change approach on supply chain from “push” to “pull” market consumption driven restocking model. This requires customers and all the players in the supply chain to be provided with real time information that strengthens their replenishment processes. It also helps in eliminating long lead times caused by ad hock procurement processes that are not demand based. Lean procurement therefore is critical in managing inventory and material forecast (Oracle, 2006).

Oracle (2006) also observed that lean procurement is based on three core pillars that are derived from demand driven manufacturing and supply chain initiatives. Strengthen and improve organizations’ “pull” supply chain processes by applying supply chain event management solutions that enhance collaboration and information sharing with suppliers. Buyer workspace and supplier self –service collaboration portals connect people ,customers, suppliers and partners in the supply chain directly to their “pull” business operations real- time. These platforms allow customers and their suppliers to communicate and share supply chain “exception based” signals in real time.

2.4.2 Lean Production

In lean systems, production processes are triggered by an actual demand and not for purposes of storage. The factory workers then run the batch as per the requirement

factoring efficiencies and costs. To enable this process flow without bottlenecks, there needs to be high level of quality at each stage in the process. Demand must also be actual and predictable so that there is no overproduction. Quality in such a process is integrated and there is assurance at each stage of production so that the subsequent work stations and processes only receive from upstream quality material (Davis and Heineke, 2005).

The six sigma principle which is also a Japanese concept is also critical in lean production where the number of defects and non-conformances per batch is managed to close to zero so that there is no re-work and re-processing as these will result to waste hence beating the philosophy of lean (Womack and Jones 1996) .

Lean production originates from the need to increase product flow velocity through the scrapping of all activities that don't create value. Lean production is essentially process oriented as it seeks to eliminate all unnecessary activities and processes hence reducing wastes in an organization (Arnheiter and Maleyeff, 2005).

2.4.3 Lean Transportation

The Association for Operations Management defines logistics as the art science of obtaining, producing, and distributing material and product in the proper place and in proper quantities. This definition takes care of location of utilities like the warehouse and the plant and it also focuses on how to evaluate movement of materials to and from those locations. When these functions are managed in a global scale then they are called international logistics.

According to Regan & Garrido (2000), lean transportation is required when managing transportation costs in a manufacturing organization where huge inventory decisions

for inbound logistics and finished goods in form of outbound logistics have to be moved along the supply chain. The challenge of making a decision on the preferred means of transporting goods from plants to customers is a complex decision since it impacts on the final cost of the product. Major logistic trade-offs relating to the transport cost of the product, speed of delivery and flexibility to react to changes are involved. Information systems play a critical role in coordinating these processes and include allocating resources, managing inventory levels, scheduling and order tracking (Regan & Garrido, 2000).

Lean transportation has very close relationship with the just in time logic (JIT) from two fronts. Number one is the critical role of transportation function in supply chain; it is the only mode of moving goods from between different nodes in the supply chain. And number two is the JIT requirements regarding time, flow and delivery hence for a JIT to be functional it must have a strong transportation support system that enables efficient flow of goods, parts and materials and ensuring their delivery is just in time. JIT should be a major guide for a business when choosing a mode of transportation. A key concern for businesses here then is related to facility layout and location and how materials will be transported across the supply chain without incurring additional unnecessary costs (Borac et al., 2010).

2.5 Drivers of Lean Supply Chain

The business environment today is very challenging and competitive and the only way to keep up with the pace and competition is to constantly re-engineer processes and address the inefficiencies in the processes. Innovation and continuous improvement is the only surest way of survival. The customer needs keep on changing and they

continuously demand more for less. With the constant changes and the reality of the demographics, businesses must be way a head in terms of their product portfolio, they must be competitive in their pricing and they must also guarantee superior quality products continuously. The only surest way of doing this is investing on research and development and running very efficiently so that production costs and other overheads are brought to minimum otherwise it would not be tenable to continuously business and offer quality to customers and run on good liquidity. The only surest way to do this is implementing and practicing lean supply chain (Borac et al., 2010).

2.6 Prospects of Lean Supply Chain

According to Womack et al. (1990), lean supply chain is the modern frontier in businesses today and it is the only surest way of remaining competitive and still offering quality products to the customers since it ensures wastes are minimized and all other activities within the supply chain streamlined to just what is necessary and essential. Its implementation however is never devoid of challenges, resistance and low acceptance levels from traditional industries and workers who believe in the old way of doing things since its implementation requires high level of preparedness for the change and in most cases employees get more stress in their work. This is because the main aim of lean is to cascade down responsibility down the structure for more accountability. (Womack et al., 1990).

Building a lean supply chain culture and structure in an organization is a complex process given the different operations across the supply chain and the way they are so interdependent as observed by Crute et al. (2003). Going lean requires a proper change management because it means a complete paradigm shift and a revolution on

the way work is done in an organization. Implementing lean requires sometimes that the total employee number is reduced, processes collapsed and sometimes people taking up more roles since lean logic is a strict commitment to waste elimination. This requires true buy-in at all levels in the organization from senior managers to shop floor workers. This sometimes does not happen as expected hence posing a challenge to lean implementation (Crute et al. 2003).

Lean implementation may also require technology improvements in terms of automation of processes. The technological infrastructure requirement for lean-automated production systems may require employees with some level of training and education and this could mean a departure from the traditional machine operators. Lean implementation could then require the knowledge and skills gap bridged or in some cases hiring new set of employees. These are difficult decisions to be made during such implementation (Czabke, Hansen & Doolen 2008).

During such changes, administrative tasks tend to be more complicated and tedious in large firms that, Managers in those businesses may not go the way of change and instead allow existing systems to continue. This is also true on implementation of new operational practices in large companies that suffer from inertia and resistance to change (Hannan and Freeman, 1984).

2.7 Operational Performance

The black law Dictionary defines operational performance management is the alignment of all business units within an organization to ensure they are working together to achieve core business goals. Operational performance measures the performance of a firm against set standards or prescribed key performance indicators

of effectiveness, efficiency and performance on planet and environment such as, cycle time, productivity, waste reduction and regulatory compliance. It focuses on maximizing organizations performance and how to boost performance at the individual, team and organizational level. For a business to realize its overall goals of growth and cost reduction, Operational performance is critical and must be given special attention (Intieri 2013).

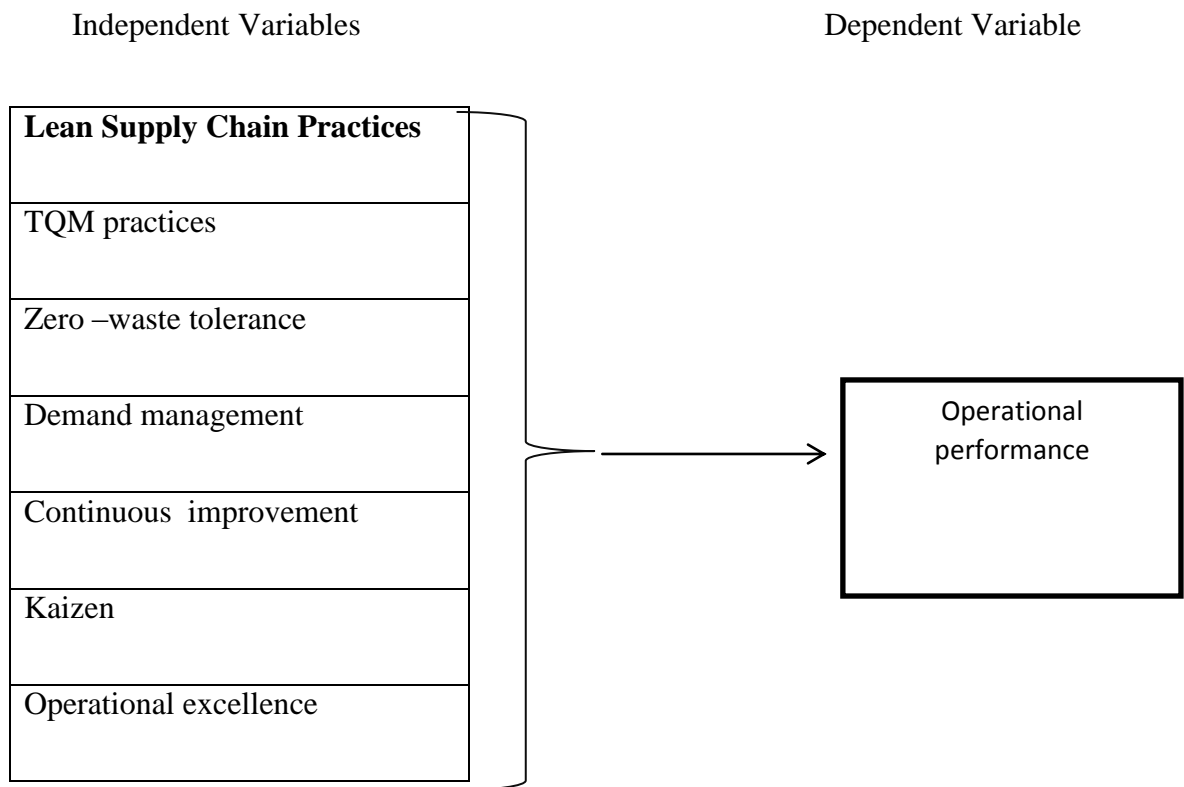
Throughput is the amount of material that enters and goes through a machine or system. In the case of manufacturing it is basically the conversion rate of raw material to finished product per certain period of time. Throughput as defined in the Business directory is the general Productivity of a machine, process, or system over a unit period, expressed in a figure-of-merit or a term meaningful in the given context, such a Work-in-process (WIP). These materials may include units currently being processed on equipment, units in transit within a manufacturing station, and units waiting processing on a work station in the facility. Carlos (1995) model notes that the amplification effects between WIP and quality defaults are evaluated under the assumption that defective items are reworked or substituted by good ones. The rework is waste that increases the cost of goods and production.

2.8 Conceptual Framework

Adoption of lean supply chain practices by Almasi Beverages Company which includes six sigma, total quality management, waste management, quality customer services, inventory management, lean procurement, lean transportation, JIT delivery services, lean production, demand management, innovations, Operational Excellence (OE), Information Communication Technology (ICT) integration in the whole supply

chain, supplier collaboration and global benchmarking would lead to improved operational performance of Almasi beverages company. This would result to more visibility in the business in terms of operations strategy, improved productivity and efficiency, reduced overheads costs, better labor utilization and at overall good customer service and performance.

Figure 2.0 Conceptual Model



Source Author (2016)

CHAPTER THREE: RESEARCH METHODOLOGY

3.1 Introduction

The chapter covers the methodology that was used to conduct the study. It presents the research design, the target population, sample design and size, data collection instruments, data collection procedure and data analysis.

3.2 Research Design

A longitudinal case study approach was employed to examine the application of lean supply chain and operational performance of Almasi beverages company where the units studied were the three Almasi bottling plants selected to the criteria described in section 3.3. A longitudinal case study research design is where the study involves observing the variable or subject over a period of time spanning over years or even a decade (Eisenhardt, 1998). For the case of this study, it covered five years before and five years after lean supply chain implementation.

According to Gerring (2005), case studies are analysis of persons, events, decisions, periods, projects institutions or other systems that are studied holistically by one or more methods. The case that was in the subject of the inquiry was of an instance of a class of phenomena that provided an analytical frame with which the study was conducted. The case study approach was suitable for this study since it also provided qualitative data and evidence which was of interest for the study.

3.3 Data Collection

The study relied on primary and secondary data collected from the management and the staff members of Almasi Beverages Company limited. Interview guide and data

capture forms were used for the top five management at the head office, the business unit heads in the three bottlers including the fifteen heads of departments. The same were also administered to six lower management staff from each business unit. The researcher administered the interview guides and secondary data capture forms to the top management and for the rest of the middle level managers; he engaged two research assistants who were trained on techniques for data collection using interview guides and data capture forms. The main business functions from which the samples were drawn included the Finance department, Sales department, manufacturing department, Operations department and the human resources department.

The interview guides had unstructured questions which were used to encourage the respondent to give as much information as possible without limitations. This was important because the study was in-depth and the researcher needed to get as much information as possible without limiting the respondents. The interviewees had opportunity to give all the information they thought was relevant including their feelings, motivation, reservations, complaints, perspective, insight and what they honestly felt about the subject of study. Secondary data and information was also obtained from the company's strategic plan, Monthly and quarterly business review papers, company quarterly and yearly audited accounts, electronic journals and internet sources.

3.4 Data Analysis

Primary data and information collected from this study was both qualitative and quantitative in nature and therefore content analysis, descriptive and inferential statistics were the most appropriate methods of data analysis for this study. Mugenda

and Mugenda (2003) define content analysis as a technique for making inferences by systematically and objectively identifying specified characteristics of messages and using the same to relate trends. Descriptive statistics is the term given to the analysis of data that helps describe, show or summarize data in a meaningful way such that a pattern might emerge (Kothari 2004). He further noted that inferential statistics are techniques that allow the use of samples to make generalizations about the populations from which the samples are drawn. Inferential statistics was applicable for the primary data captured during the interviews while descriptive statistics was appropriate for secondary data collected over the period of 2010-2014 since it allowed for presentation of the data in a more meaningful way easier to interpret and infer.

The primary data was obtained from the various management teams at different levels belonging to different departments in the three bottlers and compared against each other in order to get more data, insight and information. This research yielded qualitative data from the interview schedules and content analysis was used since this study sought to solicit data that was qualitative in nature. Content analysis was applicable in this study since it was relevant for use in analysis and interpretation of messages from the communication in the interview guides and also for examination of large volume of data obtained. Data analysis was also performed on a PC computer through the applications and regression. Fraenkel and Wallen (2011) noted that regression is working out of statistical relationship between one or more variables. The study used regression analysis to show the effect and influence of the independent variables on the dependent variables. Analysis of data collected both from primary and secondary was compared with the theoretical approaches and schools of thought cited in the literature review.

CHAPTER FOUR: DATA ANALYSIS FINDINGS AND DISCUSSIONS

4.1 Introduction

This chapter covers the data analysis and interpretation drawing from the objectives of the study. The analysis was both qualitative and quantitative. The main objective of this research was to establish effect of lean supply chain management on operational performance of Almasi Beverages Company Limited. The research is also seeking to establish areas of application of lean supply chain practices at Almasi Beverages company Ltd. The research will also determine the benefits and challenges to effective implementation of lean supply chain.

4.2 Areas of Lean Supply Chain Application

One of the objectives of this study was to determine areas of lean supply chain application at Almasi Beverages Company Limited. All the interviewees acknowledged that there was fairly a good level of lean supply chain application in most areas and functions. All the respondents interviewed that implementation of lean was still average and progressive with most of them highlighting that in procurement for example, the units of concentrate, sugar and crowns procured every month had reduced significantly and the days of cover also significantly reduced. In inbound logistics the respondents acknowledged a change of the transporters engaged to DHL logistics, Metro logistics and intraspeed to manage their inbound transportation from the port of Mombasa and also from Nairobi to the three sites. They respondents cited that the number of the transporters had reduced significantly from an initial eighteen vendors to just three. This had helped them leverage on the economies of scale and

robust engagement and they acknowledged that the inbound logistics cost had reduced by almost 35% since 2012.

In manufacturing, 75% of the respondents indicated that Almasi Beverages Company had embraced the Total Quality Management done by the production, quality and engineering team for the incoming raw material and equipment inspection. All raw materials coming in must be inspected before receipt. In the machine again, the technical team do condition monitoring during production using all the five senses and any abnormality corrected in time. This guarantees smooth runs and quality of the products at all time. The company also strictly follows its preventative maintenance schedule which usually happens every Monday and any adjustments and repairs are done on the machine to maintain its operation at optimum and this also ensures good production yields. The quality control departments also guarantees the quality of products at Almasi Beverages by first ensuring all the ingredients like water, sugar, concentrate and carbon dioxide are of the right specification and also during production runs where tests are done at each stage of the production before movement to the next station. Finished products are also picked and tested for all the quality parameters like brix, assay, clarity and even net content. This has ensured superior quality products from Almasi Beverages and also compliance to the stringent Coca-Cola standards and also friendly environmental compliance for the effluents and wastes discharged from the company.

In Operations, distribution and logistics, about 60% of the respondents acknowledged that lean supply chain had been extensively applied in the areas of transportation with regards to facility location where new warehouses have been constructed to take care of proximity to production halls and dispatch to minimize unnecessary inventory

movement which is a waste. The new delivery policy has also taken care of JIT delivery where all customer orders must be delivered within twenty four hours from the time of invoicing. On time in full which is a key supply chain metric measuring customer service and efficiency. About 50% of the respondents also highlighted from the interview schedules on the area of warehousing where inventory levels had substantially reduced by around 40% and there was more forecasting and all production plans were now demand driven and were based on real forecasted sales targets. The production planning model at Almasi Beverages has then shifted with the implementation of the new enterprise resource program (ERP) from make to stock to make to order where there is a more accurate forecast and production is based on existing demand. From a human resource stand point, lean has also been implemented with the new ERP where there has been automation and substitution of labor for capital. This has caused restructuring and development of new capabilities where the total head count has reduced from initial 850 employees to the current 540, a massive reduction by 36 %.

4.3 Operational Performance Indicators

Operational performance indicators data mainly from the company monthly, quarterly and annual business review papers as shown in Appendix II (years 2012-20116). This data was collected using the secondary data collection form (see appendix II). It was then analyzed using excel and bar graphs where the performance of the key supply chain metrics were compared between the periods of 2012 to year to date August

Table 4.1: Operational Performance Metrics Between 2012 and August 2016

YEARS \ PERIOD IN	2012	2013	2014	2015	YTD 2016 AUGUST
	METRIC PERFORMANCE				
Inventory holding (Days cover)	90.0	90.0	65.0	45.0	38.0
On time –in full (OTIF)	75.7	78.3	85.0	96.3	97.8
Line utilization %	64.4	65.7	67.2	69.0	74.1
Mechanical Efficiency - %	72.1	72.8	74.3	75.7	77.3
Sugar yields - %	97.9	96.5	99.1	99.2	99.3
Concentrate yields - %	96.2	97.0	98.0	98.9	99.5
Carbon Dioxide Yields - %	68.2	74.2	75.6	80.7	82.5
Water usage Ratio (ltrs water/ltr Bev)	2.9	2.7	2.7	2.2	2.2
Electricity usage - (ltrs bev/kwh)	24.5	25.9	25.9	27.8	29.5

Source Author (2016)

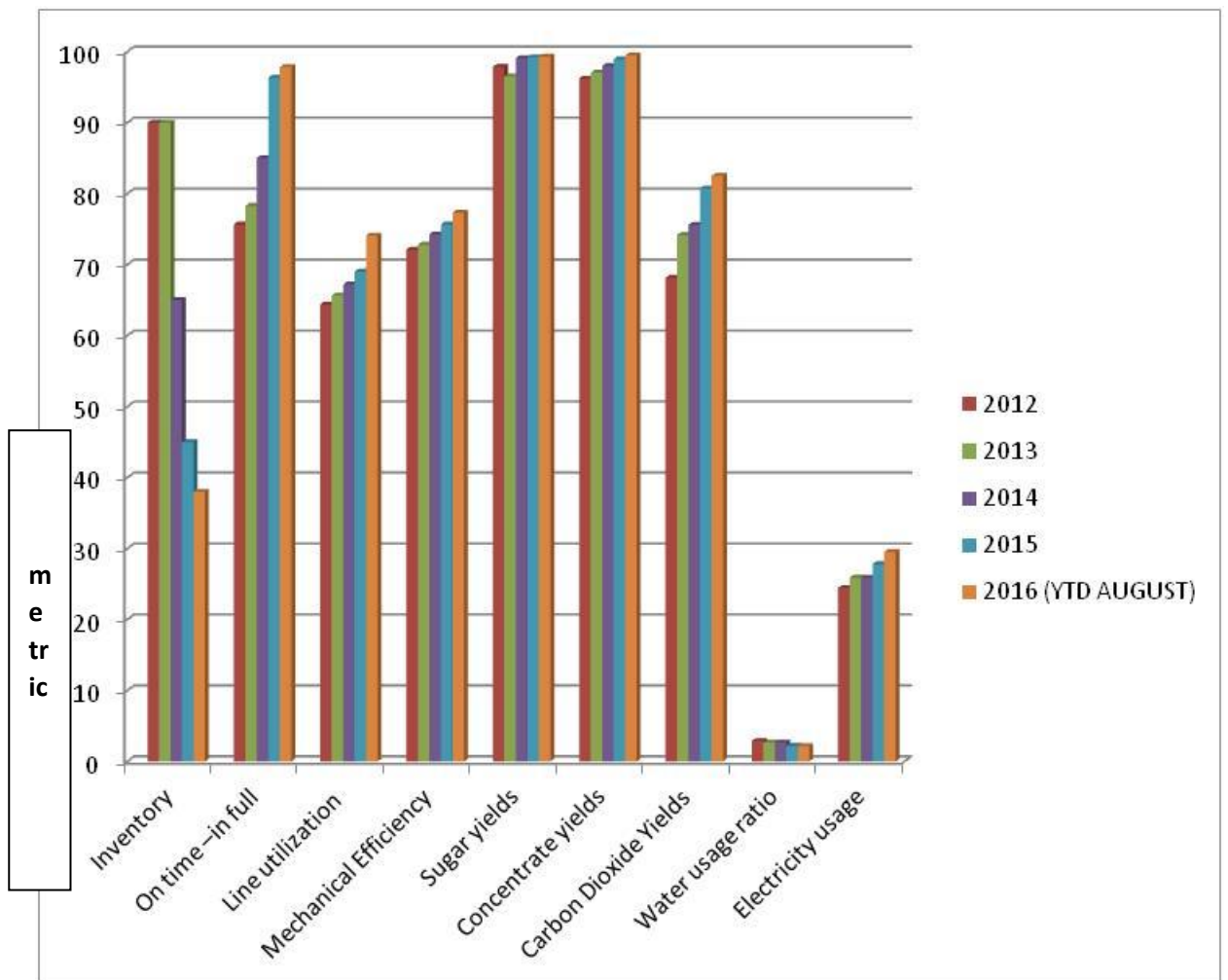


Figure 2.1 Comparative bar graph for Performance Metrics between 2012 to August 2016

Source Author (2016)

The figure (bar graph) shows trend analysis for the key supply chain metrics from the company monthly, quarterly and annual business reports where operational performance seems to be on the upward trend especially from the year 2014. Inventory days cover for example came down from an initial 90 days to 38 days by August 2016 showing very lean procurement and inventory levels. This has meant

that the company has a good cash flow and is no longer having its cash tied in inventory. On time in full (OTIF) which is another key supply chain metric has progressively improved from the data as shown with a performance of 75.67% in the year 2012 to 97.84% in August 2016 showing a big leap in the performance. This metric requires that all customer orders are delivered to them within 24 hours from the time of invoicing. The respondents said that they had fewer customer complaints and they were now managing dispatch on first in first out (FIFO). On Mechanical efficiency and line utilization, the maintenance and manufacturing reports showed a positive trajectory on the two key performance indicators (KPIs) with Mechanical Efficiency moving from a performance of 72.10% in 2012 to 77.30% by August 2016. Expenses from the company financial reports of 2015 also showed an investment of ksh 300,000,000 in the period for the critical spares for the machinery and a conformance to preventative maintenance plan of 87%.The machine performed well for the period and there were good production runs. Other Operational performance metrics around raw materials also showed significant improvements with sugar yields improving from 97.8% to 99.3%, concentrate yields from 96.21% to 99.50% and carbon dioxide yields from 68.15% to 82 .52% between the year 2012 and August 2016.Respondents alluded to improved planning, maintenance of the production line, recruitment of more qualified operators in the manufacturing line as the major contributors to the improvements in the performance and yields. They acknowledged there was a decline by almost 30% the number of under fills and over fills (non-conforming products) and on the throughput, they responded that the line performance had improved from an initial 28,500 bottles per hour to 32,000 bottles per hour which was an improvement of 12.28%.

Performance on planet and environment was also good from the quality records with a water usage ratio improvement of 2.89 litres of water per liter of beverage produced over the period to 2.17 showing a decrease of 24.9%. Most respondents alluded to better water management practices and initiatives with harvesting of rain water implemented in the company and conducting backwashing and recycling of waste water to be used in the cleaning of the factory floor and warehouses. Electricity usage had also improved over the period with a performance of 24.45 liters of beverage per kilowatt-hour of electricity in the year 2012 to 29.54 liters of beverage per kilowatt hour of electricity by August 2016. The respondents alluded to investments in energy saving bulbs and replacement of the old high power consuming compressors and cold rooms with modern ones as the key initiatives on electricity performance.

Regression analysis was applied to measure the relationship between lean supply chain management practices (TQM practices, zero-waste tolerance, demand management, continuous improvement, kaizen and operational excellence) and operational performance. The goodness of fit was worked out using total correlation and the coefficient of relationship between lean supply chain and operational performance (the strength of the relationship).

Table 4.2 shows a correlation coefficient of 0.826 and 0.682 is the determination coefficient. This is indicative of a strong relationship between lean supply chain management practices and operational performance. Thus, TQM practices, zero tolerance, demand management, continuous improvement, Kaizen, Operational excellence the account for 68.2% of the variations in operational performance.

Durbin Watson (DW) test which evaluates if the residuals of the model are not auto correlated in trying to establish the independence of the residuals produced a value of 2.029. So the conclusion is that there was no autocorrelation.

Table 4.2: Summary of the Model

R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
.826 ^a	.682	.676	.0073998	2.029

Source Author (2016)

Independent variables: TQM practices, zero tolerance, demand management, Continuous improvement, Kaizen, Operational excellence

Dependent Variable: Operational performance

Regression model is $Y=a+b_1x_1+b_2x_2+b_3x_3+b_4x_4+b_5x_5+b_6x_6$

- Where
- Y= Operational performance
 - X1= TQM Practices
 - X2= Zero waste tolerance
 - X3= Demand Management
 - X4= Continuous improvement
 - X5= Kaizen
 - X6= Operational excellence

Analysis of Variance (ANOVA) was then applied to test the significance of the relationship between variables,(model’s significance).The results in Table 4.3 shows that the regression model has a margin of error of $p < .001$. This shows that the model

has a probability of less than 0.1 of giving false prediction; this points to the significance of the model.

Table 4.3: Analysis of Variance (ANOVA)

	Sum of Squares	Df	Mean Square	F	Sig.
Regression	.204	6	.034	11.33	.000 _b
Residual	.159	53	.003		
Total	.363	59			

Source Author (2016)

Table 4.3 shows the regression coefficients of independent variables. The following regression model was computed:

$$Y = 1.524 + .912 X1 + 0.412X2 + 0.319X3+ .446 X4 + .925 X5 + 432 X6$$

From the equation, the study found that holding TQM practices, zero-waste tolerance, demand management, continuous improvement, kaizen and operational excellence at zero operational performance becomes 1.524. Additionally, when zero-waste tolerance, demand management, continuous improvement, kaizen, operational excellence are constant, a single unit increase in TQM practices would result to a .912 increase in operational performance. Further to that, TQM practices demand management, continuous improvement, kaizen and operational excellence are held constant a unit increase in zero-waste tolerance yields .412 unit increases in operational performance. When TQM practices, zero-waste tolerance, continuous improvement, kaizen, operational excellence are not changing, a single unit

improvement in demand management would result to a 0.319 increase in operational performance. Keeping TQM practices, zero-waste tolerance, demand management, kaizen and operational excellence not changing, a single unit improvement in continuous improvement would cause a rise by 0.446 in operational performance. Keeping TQM practices, zero-waste tolerance, demand management, continuous improvement, operational excellence not changing, a single unit improvement in Kaizen would result to a 0.925 better operational performance numbers, Maintaining TQM practices, zero-waste tolerance, demand management, continuous improvement and kaizen unchanged, a single unit improvement in operational excellence would result to a 0.432 better operational performance.

Table 4.4: Regression Coefficients

	Unstandardized Coefficients		Standardized Coefficients	T	Sig.
	B	Std. Error	Beta		
(Constant)	1.524	.061		.835	.633
TQM practices	.912	.311	.602	2.934	.023
Zero tolerance	.412	.105	.344	3.923	.013
Demand management	.319	.103	.224	3.097	.024
Continuous improvement	.446	.111	.338	4.018	.009
Kaizen	.925	.203	.624	4.557	.004
Operational excellence	.432	.101	.336	4.277	.005

Source Author (2016)

4.4 Effects of Lean Supply Chain on Operational Performance

From the interview schedules conducted, about 71% of the total respondents stated that the impact of Lean supply chain on operational performance of Almasi Beverages Company had generally been good and positive with reduction in wastages across the whole supply chain from procurement to sales and distribution. There had been a general reduction in days on inventory cover and this had freed cash to finance other business operations and activities. Quality had also improved significantly according to 80% of the total respondents from the interview schedules since the implementation of lean supply chain management and practices in 2014 and the cases of nonconformance had reduced by 30% since the implementation of lean. The whole supply chain had fewer wastes and leakages with the lean implementation having sealed all the areas of wastages. The company bottom-line had also improved significantly with the waste reduction, application of best practices and continuous improvement programs.

4.5 Drivers of Lean Supply Chain Adoption

Most of the respondents interviewed (about 78%) cited the major reason for lean supply chain application at Almasi Beverages as the need to improve operational performance, manage all wastes across the supply chain and to be competitive in order to grow and make more profits. High cost of raw materials (concentrate, sugar and carbon dioxide) were also cited as a major driver for lean supply chain adoption at Almasi Beverages Company Limited taking into consideration that the prices for the products were regulated and fixed by Coca-Cola company limited. It therefore requires any Coca-Cola bottling plant operating under the franchise to be efficient

across all their business processes and manage wastes in order to meet their operational costs and make profits. The third reason cited by most interviewees (about 90%), was competition from other bottlers and beverage companies for soft drinks and juices. With competition and unstable macro-economic environment, most respondents highlighted the fact that Almasi Beverages sought to protect its market share and fight off competition by reinventing and re-engineering its processes and there was a complete paradigm shift in the way it operated across functions with the major focus on customer service. They alluded to the fact that the business was centered on customer service and the customers' preference keeps on changing and they demand superior quality products at the best price possible. The business then had to reinvent to become efficient and to be able to provide more for less.

4.6 Prospects of Lean Supply Chain Implementation

The major challenge highlighted by 95% of the respondents in lean supply chain implementation at Almasi Beverages Company was resistance by the employees to accept lean supply chain as the new order. They cited that most of the employees including senior managers were not comfortable with the changes that lean supply chain adoption was bringing into the organization and their honest opinion when asked then confirmed they were comfortable with the status quo and old order. Culture change was therefore a major focus for the drivers of change as they tried to bring everybody on board.

The other challenge as highlighted by 50% of the respondents from the interview schedules was the capital investment to acquire new Enterprise resource program (ERP) which from the financials was capitalized at ksh 96 million. The ERP

according to the interviewees was necessary to be able to provide all the modules required to transact in a manufacturing and first moving consumer good industry like Almasi. The company financial position was not very good at the point of implementation where the organization reported a total profit after tax of only ksh 330 million. The company had to borrow to finance this major ICT infrastructure to help realize the change that was desired.

The other challenge highlighted by 67% the interviewees on the implementation of change at Almasi Beverages was skill gap amongst most employees particularly in production and logistics and the reality of the new technology and process improvements that would be the main catalysts of change. The company had to automate and there was substitution of labor for capital across function and collapsing of roles. This meant high turnover at the time and there were serious concerns and panic amongst employees. It required acquisition of skills and where the gaps were not significant training was done to bridge the gap. The respondents stated that there had been a lot of change management programs rolled out to accelerate acceptance of lean supply chain at Almasi Beverages.

CHAPTER FIVE: SUMMARY, CONCLUSION AND RECOMMENDATION

5.1 Introduction

This chapter covers a summary discussion on lean supply chain management and operational performance of Almasi Beverages Company Ltd. It summarizes the drivers, benefits and challenges faced in the effective implementation of lean supply chain at Almasi and the effect of lean supply chain on operational performance. Then the discussion on the findings of the study and recommendations. Finally, limitations and suggestions.

5.2 Summary of Findings

From the study, it is revealed that Almasi Beverages Company Limited had adopted several lean supply chain practices in several areas of their business processes in the supply chain over a period of time. TQM and Kaizen have been adopted extensively throughout the supply chain and especially in manufacturing where there has been visible improvement in product quality and a reduction in scrap and non-conformances. This is also evident in the production yields and outputs which have greatly improved. JIT and demand management as supply chain practices have also been moderately adopted at Almasi beverages company Limited with days of inventory cover substantially slashed meaning lean inventory and OTIF as a key supply chain metric and customer service KPI put under focus. Generally there has been good infrastructure and systems outlay for lean supply chain adoption at Almasi Beverages Company Limited but implementation is not yet fully done limiting the organization from reaping the full benefits of lean supply chain adoption.

Operational performance metrics have had a positive trend across the business at Almasi Beverages especially from 2014 after implementation of lean supply chain. During the same period after lean supply chain implementation, production yields for sugar, concentrate and carbon dioxide have been on a steady rise with a substantial reduction in scrap (under fills and overfills). Utility metric performances like water and electricity usage have also improved with serious reduction of wastes. The company profitability doubled between the full years 2014 and 2015 after lean was adopted as a way of life and all the key performance metrics showed tremendous improvements. The effect of Lean supply chain on operational performance was noted as being positive. There have been improvements with efficiencies driven in all business processes which have resulted to improved operations and quality of customer service.

The major drivers of lean supply chain management at Almasi Beverages Company Limited have been the need to improve operational performance by managing wastes, improving efficiencies hence making more profits and remaining sustainable other reasons cited included high cost of raw materials and fixed prices of the finished products by Coca-Cola. Also mentioned was competition from other bottlers and beverage industry players which required that the organization adopted lean in order to remain competitive and continue to meet its customer's demand.

On prospects of implementation of lean supply chain at Almasi Beverages Company Limited, several reasons were cited as challenges including resistance by employees who held the view that the old way of working was good and they had been used to it. They preferred the status quo and were not comfortable adopting lean as a new business philosophy. Capital investment requirement was also cited as a challenge as

lean implementation required huge investments into a new ERP to consolidate reporting and improve controls. There was also substantial investment in repair and refurbishment and automation of the production line to seal leaks and improve output and efficiencies. Lastly cited as a challenge was the skill gap of the employees with the reality that the lean supply chain philosophy required employees with certain level of skills and training to support the implementation. This slowed the implementation either by training or by recruitment of employees with the required skills.

There was no major departure from the findings of the previous studies on lean and its relationship with operational performance. The study agreed with the findings of Ondiek and Kisombe (2012) where they had noted that adoption of lean practices had a direct relationship with improvements in performance measures.

5.3 Conclusion

The findings of this research had no major departure with past research work done by other scholars. The study aimed to answer the following questions: To what extent has lean supply chain improved operational performance of Almasi Beverages Company? What were the areas of lean supply chain application in Almasi Beverages Company? and lastly what are the drivers, benefits, challenges faced by Almasi on implementation of lean supply chain practices? These questions were answered through the objective of the study which was: To determine the effects of lean supply chain practices on operational performance of Almasi Beverages Company limited.

The study found out that lean supply chain management and practices positively affected operational performance. Operational performance had improved significantly from the time of adoption of lean and efficiencies improved, wastes were

reduced and lead times between processes also substantially reduced. Almasi Beverages Company Limited had implemented lean in most of its areas throughout the supply chain, however the level of implementation was still moderate and the gains of lean had not been fully leveraged. The main drivers of lean adoption at Almasi have been, to manage wastes and improve operational performance, to get efficiencies and seal leaks because of the high cost of the key raw materials considering prices of the products are fixed. Lastly competition from other industry players has also necessitated the lean implementation in order to manage market share and achieve customer satisfaction

The main challenges faced during implementation of lean supply chain at Almasi Beverages company was resistance by employees to accept the new way of doing things and the culture change that was required to effect lean as a philosophy. Capital requirement was also found as a challenge especially for the ICT infrastructure (ERP) and for the production line refurbishment and automation to seal leaks and reduce inefficiencies.

5.4 Limitations of the Study

There was a time constraint during the study considering the period was short. Data collection also had challenges as the respondents were employees who are engaged in daily operations and could only slot in short times for the interviews. There was also no data available for the years 2010 and 2011 hence making the pre lean period analysis a limited. The concept of lean was also relatively new and hence gathering information was difficult on the path of implementation of lean at Almasi Beverages Company Limited. The dynamics in the manufacturing and first moving consumer

goods industry are so much with new inventions and technologies that the information provided may only be applicable over a given span of time. These findings May not be applicable forever.

5.5 Recommendation

From the findings of the study, it is recommended that Almasi Beverages Company adopts fully in its entire business process, lean supply practices so as to reap fully from the concept and also improve its operational performance. The entire leadership teams of Almasi Beverages need to set clear policy guidelines and strategies on lean implementation and the same to be clearly communicated to all staff as a first step to lean supply chain acceptance. The major lean supply chain practices that would turn around and revolutionize operational performance of Almasi Beverages Company are; Total quality management (TQM), Zero waste tolerance, Demand management, and Kaizen and Operational excellence.

There should be adoption of lean supply chain management in the beverage industry in Kenya and in other manufacturing firms since its impact on operational performance is huge and positive as it not only improves the performance of Key supply chain metrics but also reduction of wastes and improvement of efficiencies across the supply chain. Those organizations however have to fully implement the lean supply chain practices in all areas of their business processes. Before lean implementation, there should be a supporting infrastructure in the facility and proper change management done to the employees in the organization in order to manage resistance of culture change. The senior leadership of the organizations must take the lead and communicate clearly to the rest of the staff, the lean path and why they must

be part of the journey from the onset. Where there are skill gaps in an organization, training must be done before lean implementation to mitigate any possible challenges in understanding the concepts.

There is limited study done in the area of lean supply chain in the Beverage industry in Kenya so more study should be done not only in the Beverage industry in Kenya but extended to other sectors of the economy.

5.6 Suggestions for Further Research

Future researchers should try to assess the impact of lean supply chain on operational performance and quality of customer service in the Beverage industry in Kenya. Lean implementation in the county Governments can also be evaluated in future studies. This study can also be redone in future to confirm whether the findings would be relevant.

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APPENDICES

Appendix I: Interview Guide

NB: *The information provided will be treated with confidentiality and will NOT be used for any other purpose other than academic*

Lean supply chain management and operational performance

How does Lean supply chain help/facilitate?

- Strategy implementation in an organization?
- Defining performance indicators for the various activities?
- Restructuring of an organization to minimize wastes?
- Estimating resource requirements and application

How does lean supply chain help improve the?

- The operational performance of an organization
- The systems and procedures
- The developments of skills
- The improvement of controls
- The development of leadership
- The culture of the organization
- Production yields in manufacturing
- Sales, distribution and procurement
- Production planning and line efficiency

Lean supply chain in operational performance

How did lean supply chain help facilitate?

- How did lean supply chain help facilitate formulation of the strategic plan of the Company.
- How did the organization apply lean practices in the development of its strategic plan to help improve its operational performance and achieve its business goals
- How did the organization deal with resistance in implementation of lean supply chain

Lean supply chain in operational performance monitoring and evaluation

- How has the organization applied lean in all its business processes?
- Does the organization rely on lean when it is evaluating the implementation of strategy?
- Does the organization use lean practices to develop controls to help address any deviations in operational performance improvement strategy?


Section B: challenges of the application of lean supply chain

1. What challenges do you face in using lean in executing your day today activities?
2. In your opinion has lean supply chain management concept and practice been a useful management tool?
 - a) Yes
 - b) No
3. What would you recommend to improve lean supply chain application at Almasi Beverages?

Appendix ii: Secondary Data Capture Form

Time in years (Annual reports)		2010	2011	2012	2013	2014	2015	2016 (YTD AUGUS T)
Metric performance								
Inventory (Days cover)								
On time –in full (OTIF								
Line utilization %								
Mechanical Efficiency %								
Sugar yields %								
Concentrate yields %								
Carbon Dioxide Yields %								
Water usage ratio (Ltrs water/ltrbev)								
Electricity usage (ltrsbev/kwh)								

Appendix iii: Originality Report


Turnitin Originality Report

LEAN SUPPLY CHAIN MANAGEMENT AND OPERATIONAL PERFORMANCE OF ALMASI BEVERAGES COMPANY LIMITED
 by Hezbon K'ogollah
 From Mba project (project management)

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