

Lean Supply Chain Management; Its Prospect for a Depressed Economy Like Nigeria

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Abstract— *The role of manufacturing operations is the process of beginning a production process to a task of final assembly, with increased reliance on a significant number of supply chain participants who have differing objectives, perspectives and processes. However, an effective partnering between companies and their suppliers remains a key to lean supply chain management excellence. A lean supply chain offers competitive advantage to the suppliers, therefore the need for the Nigerian market to embrace the idea of lean based supply chain system. This paper examines the prospects of transforming from the traditional supply chain system to a lean supply chain system in Nigeria. But it is noted that the process could be tasking. It was observed that to succeed in lean supply chain management, organizations must be willing to share risks and rewards, and to build the underlying infrastructure to apply these tools. In this paper it was re-sounded that the rewards could be inflaming as various benefits such as a stronger costumer, supplier relationship, increased competitive advantage with velocity of supply etc, applies. It is concluded that, to the Nigerian economy it will be increased cash flow from the costumers and increased market forces*

Keywords—*Lean, supply chain, customers, value transformation, management.*

I. INTRODUCTION

The idea of supply chain has been in existence for a couple of decades. Supply chain logically is the process which goods or a product is delivered through firms, in supply chain, from the point of manufacturing to the end user. Using this traditional method, each firm has its own method of transferring or delivering its products to the consumers which makes the whole idea a complex one. In reality, the concept of supply chain management in modern time can be explained from these main ideas. The first idea viewed that, once a product reaches an end user, it represents the cumulative effort of multiple organizations which were involved in the transfer of that product from the production table to the end user. The activities of this network of organizations are referred to collectively as the supply chain.[1] The second idea is that while supply chains have existed for a long time, most organizations have only paid attention to what was happening within

their “four walls” [1] Therefore, few businesses understood the business of supply chain management that constitutes the chain of activities that ultimately delivered products to the final customer. The result is a disjointed and often an ineffective supply chains network.

The main objective of this paper is to increase the awareness of lean in supply chain management in Nigeria and view how to step up the lean culture in our society. It is limited to the basic knowledge of lean in supply chain management.

Various Definitions of Supply chain management are abound but [1] defines supply chain as the active management of supply chain activities to maximize customer value and achieve a sustainable competitive advantage. According to [1], it represents a conscious effort by the supply chain firms to develop and run supply chains in the most effective & efficient ways possible. The real Supply chain activities covers everything from product development, sourcing, production, and logistics, as well as the information systems needed to coordinate these activities. [2]defines **supply chain** as a system of organizations, people, technology, activities, information and resources involved in moving a product or service from supplier to customer. Supply chain activities transform natural resources, raw materials and components into a finished product that is delivered to the end customer. While [3] considers supply chain management as the sharing of information and management resources to eliminate the waste of business processes as much as possible, as one business process beyond the walls of companies, organizations, and divisions aiming for total optimization. It will be observed that organizations that make up the supply chain are linked together in two ways; the first aspect is the physical flows which involves the transformation, movement, and storage of goods and materials. They are the most visible piece of the supply chain. The second aspect is the information flows which allow the various supply chain partners to coordinate their long-term plans, and to control the day-to-day flow of goods and material up and down the supply chain.

Supply Chain Management has its own goals. The goal is to increase the company’s cash flow. This is evident from this lean supply chain model as propounded by *Jeff Trimmer and related in various articles,That:*

1. The only entity that puts money into a supply chain is the end customer.
2. The only solution that is stable over the long term is where every element of the supply chain, from raw material to end customer, profits from the business.
3. Supply chain management is about economic value added and total content of a product/ service.

Therefore, one most important objectives of the supply chain business is to increase cash flow, which is the main stream of the firms in the business. By putting the customer's value first, demands are coordinated with a business unit as a whole by using materials and resource capacity such as machines and workers; considering constraints (bottlenecks) to increase the flow from materials supply to product selling. In lean supply chain management, the cash flow speed is called "throughput". [3]

II. LEAN MANUFACTURING ENGINEERING

Lean manufacturing on the other hand, is a simple strategy of removing "waste" from a process [4] This waste can be caused by many things such as redundant steps, variation, work imbalance, quality issues, etc. Under the Lean concept, exists seven wastes in business. The rule of these wastes applies whether you are in a manufacturing or non-manufacturing industry. The seven wastes are; the waste of over processing, overproduction, motion, transport, inventory, defects, waiting [5]. All activities considered as wastes can be categorized in to one or more of these groups.

Lean looks at everything from the point of view of the customer. Anything that does not add value for the customer is considered a waste [6]. Lean thinking aims to create the best value for programme stakeholders, with minimum waste and in a minimum of time. Value, in the context of lean is defined as anything that the customer is willing to pay for.[7] Value-adding activities transform materials and information into something a customer wants while non-value-adding activities consume resources and do not directly contribute to the end result desired by the customer [4]. One most important thing to remember is that lean is not simply about eliminating waste, it is also about eliminating waste and enhancing value.[6]

Lean took its roots from the Toyota production system (TPS) in the 50's by Toyota to what is referred to today as lean manufacturing engineering or simply "Lean"[5&7] and has revolutionised the fortunes of Toyota to be the leading auto industry in the world today

Path Forward to a Lean Supply Chain

Although lean thinking is typically applied to manufacturing, lean techniques and principles are applicable anywhere there are processes to improve, including the entire

supply chain. A lean supply chain is one that produces just what and how much is needed, when it is needed, and where it is needed.[8]. What is Lean Supply Chain can be defined as a system of interconnected and interdependent partners that operate in unison to accomplish supply chain objective [9]. In a typical supply chain network, metrics are involved which are monitored and reviewed frequently to ensure that the supply chain objectives are met. Some of the objectives as stated by [9] include;

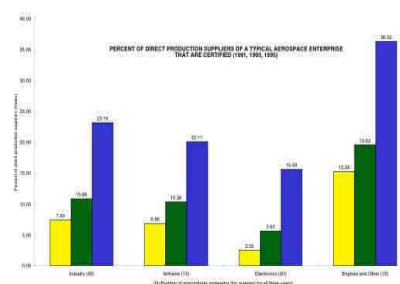
1. Eliminating all waste in the supply chain would create value for a smooth flow process of products and communication downstream in a supply chain network.
2. Consideration be given to advancements in technology to improve the lean supply chain management network like; use of various forms of software and [Electronic Data Interface](#) (EDI), efficient transportation system, GPS for tracking freight etc
3. Allowing customer usage to become visible to all members in the supply chain to create free flow of process in the lean supply chain network.
4. Reducing lead time which will reduce inbound and outbound transportation logistics
5. The use of pull system such as **Kanban** in order to reduce wasteful complexity in planning and overproduction.

The concepts of lean apply to all elements of the supply chain, including support departments such as product development, quality and human resources, marketing, finance, purchasing, warehousing and distribution [8] The idea of bringing lean engineering concept into supply chain is to bring all these areas of supply chain that do not add value to the process and make them work together as a single entity to reduce waste and create flow. For instance, the Aerospace industries in the advanced nations like the US and Europe, has made important strides in supplier integration through;

Production: Supplier certification and long-term supplier partnerships -process control & parts synchronization

Development: Early supplier integration into product development critical

Strategic supply chain design is a Meta core competency. [10]

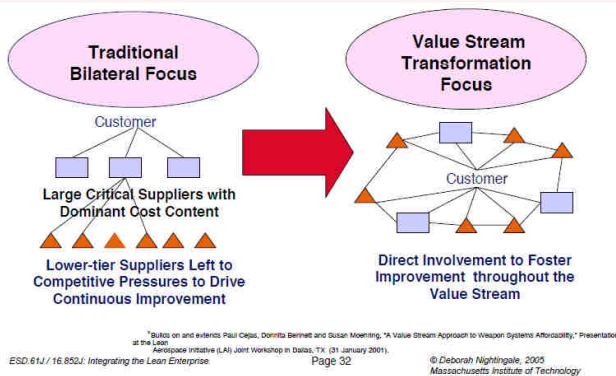


source:[9]

Duplication and a lack of appropriate and timely communication run rampant in these traditional organizations. However a lean supply chain is proactive and plans for the unexpected by positioning all resources for effectiveness. [8]. Downturns in demand can be addressed without layoffs or significant productivity losses. It should be realised that; changing a traditional organisation which is not lean compliant to a lean processed firm could be challenging. This means that workers need to be given full orientation on lean management principles as part of the change process. In the hierarchy of support areas, it is even more challenging for the people to understand how lean could be beneficial to them [11]

The concept of “Lean,” has been around in one form or another for many years, at least in manufacturing. It is only recently that it has been applied to the supply chain & logistics management area.[12]

For instance, according to [13] as quoted in[11] it took Toyota 20 years educating lean suppliers, though, which explain why organisations hesitate to adopt lean. [11] Explained that, back in the 1980s when Toyota was considering setting up manufacturing facilities in the United States, it was skeptical about whether or not the lean philosophy would be embraced by American suppliers. Instead of going it alone, Toyota entered into a joint venture with General Motors to operate the New United Motor Manufacturing Inc (NUMMI) plant in Fremont, California [8] however the relative success of that plant [NUMMI] convinced Toyota that Toyota Production System (TPS) or what is today called lean, could be transplanted to the United States.



Lean supply chain in Nigerian organisations

Application of lean concept in Nigerian supply chain network would be a very big task considering the very slow developmental strides, the level of education and skills of workers and accessibility to such new trends. However, a complete lean concept in Nigerian supply chain would mean rejuvenating the industries and organisations to meet up world standard in terms of cash flow. As stated by [13] it took Toyota 20 years to educate supplier and convince America that lean could work in the US. Nigeria may not be an exception as the advanced worlds have

all embraced lean and today the result is a flourishing industry and supply chain network.

In setting up a supply chain management network in Nigeria one would expect the following components of lean supply chain to apply as stated by [14] as follows:

Lean suppliers should be able to adapt to changes through training and developments and be encouraged in their various organisations to make the lean transformation agenda by involving them in value stream activities. The result is a continually declining price target which can be set by the organisation and increasing quality goals

Lean procurement is another component of the lean supply chain and must be visible to both customers and suppliers. But some lean procurement processes are e-procurement and automated procurement. E-procurement conducts transactions, strategic sourcing, bidding, and reverses auctions using Web-based applications.

Lean manufacturing systems typically presents the greatest opportunity for cost reduction and quality improvement; as many organizations operating lean in the advanced worlds have received huge benefits from lean concepts in various functions. One good reason for this paper.

Lean warehousing system eliminating non-value added steps and waste in product storage processes. Typical warehousing functions are: receiving, storing, replenishment, picking, packing and shipping.

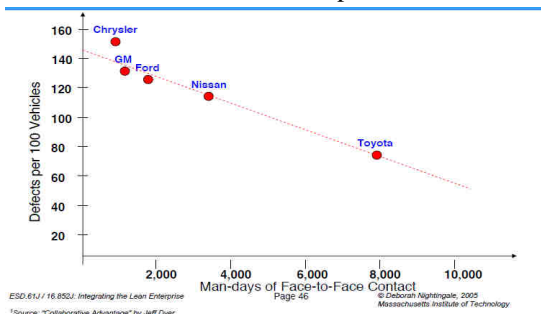
A transportation system using lean concept such as core carrier programs, improved transportation administrative processes and automated functions, optimized mode selection and pooling orders, import/export transportation processes, inbound transportation and backhauls. Accomplishing these concepts would involve mapping the value stream, creating flow, reducing waste in processes, and eliminating non-value added activities and using pull processes

Lean customers who understand their business needs and therefore can specify meaningful requirements. They are always seeking methods of continuous improvement in the total supply chain to reduce costs. Lean customers expect value from the products they purchase and provide value to the consumers who they interact with.

Results and benefits of the lean supply chain system as it would apply to the Nigerian market.

- A Lean supply chain system allows room for Speed and Responsiveness to Customers.[8&15] This means the Nigerian consumers would not only start enjoying a more efficient process, but also faster as the culture of lean takes over the entire supply chain links, increasing their velocity. Examples are the new marketing trend like “Konga and Jumai” in Nigeria’s e-online marketing.

- In the lean paradigm, inventory is considered waste therefore to the consumers; a reduced inventory would be an advantage.
- Customers have the advantage of a Reduced Costs as the traditional mass production method tries to minimize unit costs by increasing total production over the life cycle of the product.
- A Lean supply chain promotes improved customer satisfaction as it minimizing new product development time and expense. This delivers the product to the Nigerian market faster, making it easier to incorporate current requirements into the product. “Konga and Jumai”
- A lean Supply Chain is a Competitive Weapon as it enables the member companies in business to align themselves with each other and to coordinate their continuous improvement efforts.



III. CONCLUSIONS

Because the Internet provides us with unprecedented opportunities for sharing information and conducting transactions across the supply chain, companies should have a sense of urgency about adopting lean concepts. But all chain partners have to be on the same playing field, and the lean concept is intended to let everyone reach new levels of efficiency and effectiveness.

A strong lean supply chain enables the member companies to align themselves with each other and to coordinate their continuous improvement efforts. This synthesis enables even smaller firms to participate in the results of lean efforts. Competitive advantage and leadership in the global marketplace can be gained by applying lean principles to the supply chain management. [8&15] States that though, commitment, planning, collaborations are required, for a pathway forward.

Nigerian being a developing nation would strive so hard to implementing lean knowledge and concept in her citizenry to keep the abreast with other countries in the developing world if Nigerian is to meet her objectives of among the twenty developing world by 2020. A “lean” Nigeria would mean meeting a new developmental concept in industrial operations in manufacturing and supply

chain management. In the beginning it might be difficult to start because variance however, the results and benefits would justify the means.

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APENDIX A

ILLUSTRATIVE CHARAC- TERISTICS	CONVENTIONAL MODEL	LEAN MODEL
Number & structure	Many; vertical	Fewer; clustered
Procurement personnel	Large	Limited
Outsourcing	Cost-based	Strategic
Nature of interactions	Adversarial; zero-sum	Cooperative; positive-sum
Relationship focus	Transaction-focused	Mutually-beneficial
Selection criteria	Lowest price	Performance
Contract length	Short-term	Long-term
Pricing practices	Competitive bids	Target costing
Price changes	Upward	Downward
Quality	Inspection-intensive	Designed-in
Delivery	Large quantities	Smaller quantities (JIT)
Inventory buffers	Large	Minimized; eliminated
Communication	Limited; task-related	Extensive; multi-level
Information flow	Directive; one-way	Collaborative; two-way
Role in development	Limited; build-to-print	Substantial
Production flexibility	Low	High
Technology sharing	Very limited; nonexistent	Extensive
Dedicated investments	Minimal-to-some	Substantial
Mutual commitment	Very limited; nonexistent	High
Governance	Market-driven	Self-governing
Future expectations	No guarantee	Considerable