

Current Issues and Emerging Trends in Logistics and Supply Chain Management in Oman

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Abstract

Purpose: The current trend in which firms are facing an ever-changing business environment requires revamping of strategic processes for these firms to remain valid and competitive. The search for key processes has made it possible for firms to realize that logistics activities and supply chains are the key success factors. This study seeks to explore the current trends in logistics and supply chain management which enable companies to be resilient and remain competitive in the ever-changing business environment. The study will highlight challenges and opportunities posed by these new trends including those posed by the current pandemic COVID-19.

Design/Methodology/Approach: the study will be focusing on the use of secondary data. Secondary data will be solicited from literature review on new trends in logistics and supply chain management will be delimited to the last two decades and it is from these sources that a conceptional framework will be devised.

Findings: Preliminary literature shows that relationships, responsiveness, integration, performance measurement, risk management and incentives as well as technological developments have emerged as current trends in logistics and supply chain management.

Research Limitations/Implications: The current pandemic of COVID-19 limited the accessibility to participants to validate the conceptional model.

Practical Implications: The study recommendations will be proffered to both industry practitioners and fellow researchers where their upcoming operational and strategic plans may take advantages of the proposed model.

Originality/Value: Supply chains are no longer linear as previously thought but are characterized by a network of partners who are autonomous and heterogeneous. In addition, advancement in technology has seen such changes as direct digital manufacturing and augmented reality which have assisted in fast trekking processes (Cannella *et al.*, 2018).

Keywords: Logistics, Supply Chain, Supply Chain Management, Current Trends, Emerging Issues

Paper Category: Literature Review Paper

1. Introduction

Supply chain management has been defined by Simchi-Levi, Kamsinky and Simchi-Levi (2009) as “a set of approaches utilized to efficiently integrate suppliers, manufacturers, distributors and retailers in order to produce goods whilst minimizing system wide costs and attaining customer satisfaction.” It is unavoidable for firms to revisit and reshape their marketing and procurement strategies given the pressure to continue gaining competitive advantage and surviving in turf global environments. A variety of options are available for firms to pursue it to survive in the current uncertain and disruptive markets brought about by globalization. The concept of supply chain management is one such strategy firms can embrace to leverage their competitive positions. Supply chain cannot be fully understood without talking about its enablers. Sunil and Millie (2013) posit that the focus of supply chain management should be targeted at the overall process and including all partners rather than members acting individually. These processes should be designed in such a manner that the customer's requirements are addressed, and the same customer gets the maximum benefit.

The success and survival of any business in a turbulent world is dependent upon efficient supply chain management strategies (Groznika and Trkman, 2012). The authors went on to say that successful implementation of supply chain initiative is the greatest hinderance besides taking the same initiative on board. Competition in the modern business world is no longer between individual companies, but within supply chains (Rodriguez, 2008; Trkman & McCormick, 2009). Earlier, Mehra (2005) had indicated that supply chains need to be continuously monitored as they are an important component of all business planning. The author had proposed examination of future trends which may impact on business plans which is necessitated by everchanging dynamics of the global market.

The paper intends to explore three basic areas in supply chain management which need to be understood from the onset namely, drivers of supply chain, levels of maturity in supply chains and the supply chain management practices. Drivers of supply chain have been suggested by Shahzadi, Amin and Chaudhary (2013) as facilities, transportation, inventory, procurement, pricing, and information (see Figure 1). The paper authors decided to name these drivers enablers since they enable the efficiency and effective operation of the supply chain. The prevailing complex business environment can only be dealt with using strategies such as supply chain management (Manuj and Sahin, 2011; Serdasaran, 2013). This understanding is supported by other researchers who reiterate that supply chain has been evolving over the last two decades (Banyai, Banyai and Illes, 2017; Cannella, Dominguez Framinan and Ponte, 2018). Since supply chain has not remained stagnant, it follows that it must be embraced as existing developments are meant to be aligned to prevailing environmental dictates.

2. Literature Review

Groznika and Trkman (2012) suggest strategic insight, business redesign, supply chain risks, supply chain frameworks and standard, performance measurement and information systems (IS) support for supply chain management as current issues in that field. McCormack and Lockmay (2004) proposed the following supply chain maturity levels, ad hoc, defined, linked, integrated, and extended. They urged that the ad hoc stage of maturity supply chain is ill-defined and traditional ways of doing business are being practiced. At the defined stage the supply chain processes are well documented and defined but some traditional way of doing business still exists.

The third level of maturity is the linked phase in which organizational departments are working together to achieve a common goal. Integrated phase of maturity represents involvement of all supply chain partners and the supply chain processes are advanced. The extended phase of maturity is characterized with competition not at organizational level but among supply chains with a strong focus on customer satisfaction.

2.1 Supply Chain Drivers (Enablers)

For effective supply chain, there are certain drivers must be adapted by organizations and these drivers have been identified through the literature and suggested by Shahzadi, Amin and Chaudhary (2013) as facilities, transportation, inventory, procurement, pricing, and information (see Figure 1).

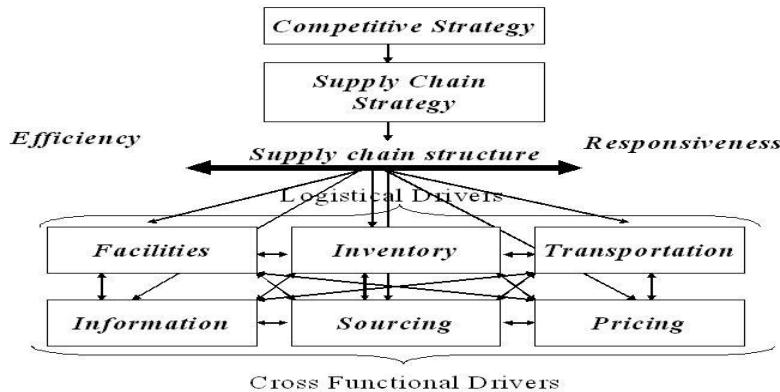
Facilities: Shahzadi *et al.*, (2013) indicate that facilities are necessary in supply chain setup of current business environments. Facilities refers to either production or warehouse places where inventory will either be produced or kept for specific reasons. Shabbir and Kassim (2018) content that facilities refer to the physical placement of warehouses, storerooms, raw materials, work-in-progress (W.I.P) and finished goods in the supply chain. This supply chain enabler must be considered not only in isolation of the size of the warehouse or production facilities but including the location of the facilities. Firms which want to respond quickly to the demands of their customers must have their facilities located as close to their demand market as possible, whereas firms which deal with heavy raw materials as their inputs must locate their facilities closer to their supply market. This avoids the transportation costs if the raw materials are to be carried over very long distances before they are processed.

Langley, Coyle, Gibson, Novack and Bardi, (2008) reiterate that, “network facilities, that is plants, distribution centers, terminals and so on, and supporting transportation services have long been considered important”. Decision makers must be prepared to address such issues as whether to have a centralized distribution center or to decentralize warehousing facilities bearing in mind that the continuum in logistics and supply chain is between responsiveness and cost efficiency. International shipment of goods requires storage facilities (Langley *et al.*, 2008) and this means make-or-buy decisions must be undertaken. Supply chain partners will have to make decisions whether to own facilities in different parts of the globe or whether to rent. Responsiveness and quick access to products is maximized by designing more efficient and responsive facilities in the supply chain (Shabbir and Kassim, 2018).

Inventory: Inventory is a term use to describe all the goods and materials held by an organization for sale or use (Lysons, 2006). Inventory is the blood life of any organization let alone the supply chain. Inventory exists because of mismatch between supply and demand and therefore it follows that some policy must be crafted to achieve organizational objectives. Policies may include inventory levels, approaches such as push or pull demand and stock control strategies. A large quantity of inventory places an organization at a better position regarding responsiveness to demand yet at the same time costs associated with holding stocks tend to go up. On the other hand, less quantities of inventory lowers customers responsiveness. A sudden change in inventory policy can have a drastic and devastating effect on the performance of the supply chain. The current

supernatural phenomenon of Covid-19 has frustrated many supply chains' inventory holding policies.

A Framework for Structuring Drivers



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Figure 1: Framework for Supply Chain Drivers

Reza Nasiri *et al.* (2010) posit that decisions about what inventory to hold, where to keep the inventory, how much to keep are better made when there has been a deliberate attempt to define the distribution networks in a supply chain. Organizational efficiency and performance are improved by a good network of inventory management partners in the chain (Shahzadi *et al.*, 2013). Salimi *et al.* (2016) reiterate that firms employ experts to produce desirable inventory levels and ensure efficient and effective partnerships within the supply chain to minimize levels of stocks. Inventory management strategies which firms may use include vendor managed inventory (VMI), just-in-time (JIT) and lean manufacturing relative to the situation (Shabbir and Kassim, 2018). Khan and Qianli (2017) suggest inventory postponement (agile manufacturing) and inventory consignment.

Transportation: Transportation has been viewed as the glue that makes the supply chain tick (Langley *et al.*, 2008). Yet Zhahzadi *et al.* (2013) urge that transportation is regarded as the biggest problem in supply chain management. We support that thinking given that transportation services are usually hired/contracted from outsiders whose control is not from within the supply chain partners except in the form of such penalties as transit losses. Transport is the physical which connects the supply chain partners, their facilities and the ultimate consumer. It is vital for supply chain partners to make informed decisions about transport services they engage for both efficiency and responsiveness to be accomplished.

The purpose of transportation services in supply chain is to move the product from where it has been processed/produced to the final consumer. Its main role is to contribute to place utility, time utility, and quantity utility. Supply chain partners must agree on the mode to be selected, the route to follow and the loading instruction must be available at appropriate times before the loading

takes place. Stindt (2016) suggests a model which includes smart infrastructure, smart vehicles, smart freight (which is the cargo), implying that there must be infrastructure to go hand in hand with a selected mode of transport in addition to proper packaging of the cargo/consignment itself. In some cases, a joint route planning strategy may be necessary which involves either the firm and its suppliers in the chain or the firm and its customers (Shabbir and Kassim, 2018). Timely delivery of cargo is maximized by efficient transport system.

Information: Information plays a significant role in supply chain and has been viewed as the biggest driver of the supply chain. It enables coordination throughout the supply chain and makes it easy for partners to work without any confusion or fear. Langley *et al.* (2008) posit that information has been branded the lifeline of business as it is vital for effective decision-making and to take appropriate action. The same authors say that information, in addition to money, must be readily available within the supply chain to enable the planning, execution and evaluation of key processes. Knowledge of information about the previous supply chain enablers, that is facilities, transportation, inventory in addition to pricing and procurement is very important. Fortunately, existing supply chain information technologies can support timely, cost-efficient sharing of information among supply chain partners, and these include suppliers, manufacturers, intermediaries, logistics service providers and customers (Langley *et al.*, 2008).

It is important to manage the availability and distribution of information within these supply chains as it can be dangerous if care is not taken. For instance, some unethical partners might end up sharing sensitive information to players in the sector who are not part of the chain. Walter (2006) analyzed the role of information management in supply chain efficiencies highlighting that information is very important in any organization be it manufacturing or service oriented. Part of information management strategies may include signing of official secrecy contractual agreements within and between partners in the supply chain. Categorizing information shared among supply chain members is beneficial as this helps in directing information where it is needed. For instance, Shahzah *et al.* (2013) suggest transaction processing, supply chain planning and collaboration as well as order processing and delivery coordination as categories of information. Focus will then be on directing information where it should go for the benefit of the supply chain network.

When supply chain members have symmetric information, uncertainties in the chain are reduced to a minimum even though they may not necessarily disappear (Shabbir and Kassim, 2018). The effectiveness of the supply chain is enhanced by equal distribution of information among the supply chain partners. For instance, Turkey *et al.* (2016) posits that maximization of green initiative goals within the supply chain is achieved by continuously communicating with the firm's customers. Abbasi (2012) postulates that business information systems developed within the firm must capture demand and supply patterns to remain sustainable.

Sourcing/Procurement: Pazireandaeh (2011) argued that if the best sourcing strategy is to be selected, it is important to start by investigating the product, the organization, and the country factors of the required list of raw materials or finished products. Choices must be made within supply chains regarding the performance of certain supply chain activities. This is not a simple task but requires care and effort of authorized personnel to engage outsiders and this function falls under the jurisdiction of the supply or procurement department. Sustainability in business

operations can be attained by the adaptation of green sourcing options with key suppliers in the chain (Shabbir and Kassim, 2018).

Pricing: Yong *et al.* (2012) suggest that there is an interrelationship that exists between expectation and price fluctuation within the supply chain activities. For instance, the prevailing economic conditions because of CoViD-19 have made prices unstable for products, transportation services, facilities, and information systems gadgets such as laptops which went up because of rise in online teaching and learning services. Shabbir and Kassim (2018) contend that supply chain suppliers and customer can be satisfied if the pricing policy tries to align prices with prevailing market conditions. Shahzadi *et al.* (2013) content that pricing strategies which firms may use include geographic pricing, mark-up and bundling approaches and these have been known to bring benefits the supply chain. Pricing approaches affect buyer behavior wherein the buyer can start searching for substitute goods/service or move to the firm's direct competitors if the buyer discovers that the current firm's prices are not justified. On the other hand, supplier may be adversely affected by very low prices contracted by the buying firm if these are not revised on a regular basis which may result in closure/bankruptcy of the company. This, however, will obviously have a lasting impact on the whole supply chain.

In view of the supply chain drivers, its essential to identify supply chain management practices that must be considered to ensure effective supply chain management alongside the drivers/enablers. Spina *et al.* (2015) compiled list of supply chain management practices such as collaboration, demand and supply planning, inventory, production and distribution and logistics as illustrated in table 1.

Table 1: Supply Chain Management Practices

Supply Chain Management Practices	Contributions
Collaboration	<ul style="list-style-type: none"> • Collaboration practice is related to the perspectives of transaction costs, resource-based view, extended resource-based view, and rational view (Cao and Zhang, 2011) • Vendor managed inventory (VMI) and collaborative planning, forecasting and replenishment (CPFR) programs are examples of collaborative practices (Cigolini, Cozzi and Perona, 2004) • Collaborative practices do not involve only technical initiatives, but also simulation and optimization systems: ERPs, MRPs, what-if scenarios (Gimenez <i>et al.</i>, 2012) • The exchange of information involves sharing critical information while coordination affects how firms will process exalt mutual benefits. Collaborative practices have explained approximately 23.7% of enterprise performance variability Flynn <i>et al.</i>, 2010) • Internal and external collaboration practices explained 8.5% of enterprise performance variability in Malaysia (Sukati <i>et al.</i>, 2013)
Demand and Supply Planning	<ul style="list-style-type: none"> • Planning practice is based on decision-making that is centralized and in combination with company areas (Feng, 2010) • Practices must incorporate qualitative and quantitative elements in order to improve forecast accuracy: promotions, cannibalization, product life cycle, seasonal variation, trends prices (Ramanathan, 2012) • Planning practices and frequent updating due to fluctuations in demand, prices, costs, lead-time (Jonsson and Mattsson, 2008)
Inventory, Production	<ul style="list-style-type: none"> • Lean philosophy is a way of minimizing waste in the production process: excess inventory, inactivity, set-up time reduction (Chavez <i>et al.</i>, 2012; Li <i>et al.</i>, 2005)

and Distribution	<ul style="list-style-type: none"> JIT practices seek to minimize the level of inventory, ensure product quality and equipment reliability (Cigolizi, Cozzi and Perona, 2004) Production practices (re-order point, Kanban, MRP) are applicable according to the type of product and inventory to be employed (Jonsson and Mattsson, 2008) APS practices use the same concept of finite capacity and prioritization during the planning and not at <i>posteriori</i> (Jonsson and Mattsson, 2008) DRP practices use the same logic as MRP to determine which products should be distributed, when and where (Cigolizi, Cozzi and Perona, 2004)
Logistics	<ul style="list-style-type: none"> Location and modernizing operations in warehouse bring benefits such as quick response and regular inventory replenishment associated with better loading techniques (Cigolizi, Cozzi and Perona, 2004) Partnership with key companies to firm's operations is vital for supporting logistical services, transportation, and movement (Chen and Pauraj, 2004) Designing the load plan and routes is a vital element of which is needed to support decisions on inventory level and transportation costs (Cigolizi, Cozzi and Perona, 2004) Transportation costs can be economized by first identifying followed by selecting the best route that must be taken to reduce costs (Cigolizi, Cozzi and Perona, 2004)

Source: Spina et al. (2015:3)

3. Research Methodology

The purpose of the paper was to identify the current issues and trends within the logistics and Supply Chain Management that could be utilized in Oman. In fulfilling the study objectives, the authors believed to use a systematic literature review as the best option the which reduced errors and bias in the process by clearly indicating phrases to include and exclude in the search. This started by choosing search engines which were available and accessible to the researchers namely, Google Advanced search, Masader (a search engine available for institutions of higher education in Oman) and ResearchGate. These were chosen because they provided excellent journals that were peer reviewed. The period of analysis of literature was limited to two decades assuming that the discipline of supply chain is relatively emerging and narrowing down the keys search words to supply chain management would further limit the journals available. In addition, English was used as the official language in which articles had to be written. Books, book chapters, editorials, reviewed technical documents and conference papers were excluded from the search. To find the related journal articles focusing on supply chain management, key words used were, supply chain management, supply chain performance, supply chain drivers, supply chain maturity levels, supply chain practices.

It's anticipated that the literature review will offer the opportunity to develop a conceptual model to help Omani organizations in achieving logistics and organizational performance. The development of such conceptual model would represent the new trends that are emerging especially with the logistics and supply chain in Oman.

4. Framework Development and Discussion

Shahzadi et al. (2013) were used as the main proponents of supply chain drivers. Six drivers were identified, and these included facilities, inventory, transportation, procurement (sourcing), information and pricing. The same drivers were also suggested by Mazzawi and Alawamleh (2013) with a slight addition on classifying these drivers into two major groups namely logistical drivers and cross-functional drivers. Mazzawi and Alawamleh suggested facilities, inventory, and transportation as logistical drivers possibly picking from the definition of logistics that it is a discipline concerned about timely related positioning of resources. Which addressed questions

around what to order (inventory), where to place the inventory (facilities), and how to move it (transportation). The cross-functional drivers were observed as all arounders with information playing the biggest role since players in supply must know the type of inventory to deal with, size of facilities they require, the transport to be used, the price to be paid for all services provided leading to a competitive pricing system to their customer.

McCormack and Lockmay (2004) popularized the levels of maturity of the supply chain which are basically five namely, ad hoc stage, defined stage, linked stage, integrated stage, and extended stage. A supply chain which is at the ad hoc stage is characterized by ill-defined processes and systems including poor documentation. The defined stage in maturity is characterized by presence of documents that are required to execute task in the supply chain and these documents are necessary for both audit purposes and future clarifications. Departments of individual supply chain partners refrain from acting on a silo-mentality approach and start working together. Integrated maturity level of supply chain is marked by partnerships in supply chains which is necessary for information sharing and risk reduction. The extended stage of the level of maturity in supply chain management is characterized by competition among supply chains and not individual companies. Literature review revealed that collaboration, demand and supply planning, inventory, production, and distribution planning as well as logistics are the most popular supply chain management practices (Spina et al., 2015). Supply chain that embraces collaboration work together with other partners to the extent of sharing information using such programs as enterprise resource planning (ERP), materials requirements planning (MRP) and many more. Demand planning entails gathering data about historical demand and using that data to forecast and plan. Supply planning is like demand planning with the only difference being that in the later a supply chain is concerned about its sources of raw materials and in the later, the partners are focused on what is demanded. We therefore proposed the research framework below to be used for empirical evidence.

Based on all the concepts that were discussed regarding supply chain drivers, maturity level and practices from the literature, the authors have conceptualized a model based on these concepts that could lead to supply chain performance (see Figure 2).

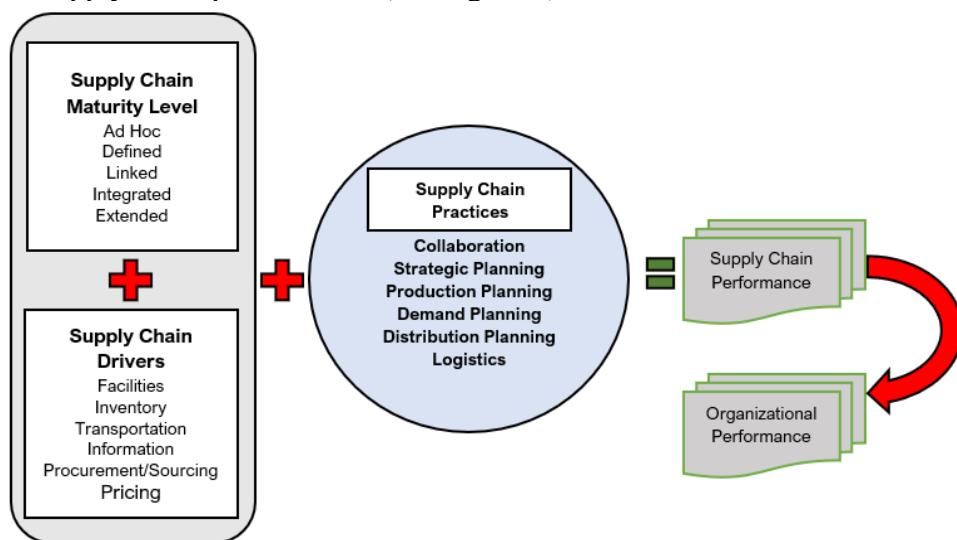


Figure 2: Conceptual Framework

The model proposes a clear understanding of the elements of organizational performance. This is rooted in the combination of maturity levels of supply chain and drivers of supply chain whose fusion enhances supply chain practices. For instance, a mature supply chain will embrace collaboration because the partners can trust each other and share information such as inventory levels or demand. This synergistic approach improves individual organizational performance leading to the overall performance of the supply chain.

5. Conclusion and Implications

The study concluded that supply chain maturity levels, supply chain drivers and supply chain management practices amass current debates in the supply chain field of study for both academicians and industry practitioners. It is not a secret that among the several objectives that firms have, competitiveness, profitability, customer responsiveness located at the top of the list. Therefore, there is need for both offensive and defensive business improvement approaches (Shukla et al., 2011). We suggest that companies take a deeper look and understanding of their supply chains and embrace the suggested cutting-edge concepts which include supply chain maturity levels, supply chain drivers and supply chain management practices. Examination of the nature, interrelations and dependency among these concepts is critical for achievement of better performance result. Benchmarking will always provide a better insight regarding a suitable roadmap for the challenge of implementation of these concepts.

6. Study Limitations and Future Scope

The study could not be carried out in selected industrial sectors because of the current pandemic Covid-19 which has restricted operations. This pandemic has seen governments putting in place measures such as allowing only 30 percent of working staff to be at premises and in some cases imposing lockdown levels. This has been done to contain the virus but apparently these measures have resulted in some operations coming to a halt for some time. It is under these circumstances that researchers found it impossible to get cooperation from industry. Future research should be focused on studying supply chains in specific sectors and refrain from generalizing, where the conceptual model can be tested and validated.

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