



UNCLEAR CONCEPTUAL BOUNDARIES BETWEEN SUPPLY CHAIN, VALUE CHAIN AND LOGISTICS: A REVIEW OF CONCEPTS, ORIGINS AND RELATIONSHIPS

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ABSTRACT

Confusion exists among academicians and practitioners on the application of supply chain, value chain, and logistics in the business field. Some use these terms interchangeably while others consider them as different. This paper has tried to present a comprehensive analysis on the differences that exists between these concepts, through a systematic literature review, involving 48 research articles, and gray literature. The paper traced the origin of each term, the relationship between them, and their differences. It was found that, there are differences and similarities among these concepts. The paper therefore concluded that, while the academic language has strived to bring out the distinction among supply chain, value chain and logistics, the overlapping roles and close connection between these concepts cannot be denied. What comes out clearly is that all the three concepts aim at adding value, not only to the product sold to the customers but also to the organisation in regards to the increased profit margin. This study recommends that supply chain educators, researchers, and practitioners put more effort into providing training to the scholarly community about the usage of and interaction among these concepts.

Key words: Supply chain, Value chain, Logistics, Value, Evolution

Paper type: Research paper

Type of Review: Peer Review

1. INTRODUCTION

The concepts of supply chain, value chain, and logistics are still confusing many logistics or supply chain educators, researchers, and practitioners (Lalonde, 1997). While some practitioners use these terms interchangeably by considering that they have the same meaning but others consider these terms differently (Monczka, 2009). It becomes so difficult for trainers in developing educational experts, research, and consultancy programmes related to the mentioned fields without a large overlap with each other due to the presence of unclear conceptual boundaries that exist between the supply chain, value chain and logistics (Larson & Halldorsson, 2004). Cooper, Lambert and Pagh (1997) argued that there is a need to indicate and expand the boundaries that exist between supply chain, value chain and logistics.



Similarly, Roko and Opusunju (2016) found that value chain as a concept is too broad and some practitioners are confused on what it entails. Likewise, Frankel *et al.* (2008) failed to distinguish these concepts when he defined supply chain management as the management of procurement, sourcing, production and logistics activities. Also, Mchopa, William and Kimaro(2020) described that, the supply chain encompasses upstream supply chain activities such as acquiring production inputs from suppliers and downstream supply chain activities such as distribution of final products to the end consumers. Therefore, it is impossible or too difficult to develop and implement the educational, consultancy, and research programmes related to the mentioned terms without understanding the boundaries that exist between them.

This expands a more thorough thoughtful of the concept of the terms logistics, supply chain and value chain. The paper traced and reviews the origin of each term, the relationship that exists among the supply chain, value chain, and logistics, similarities and the way they differ from each other. Therefore, the rationale of this paper is to present the conceptual boundaries that exist between supply chain, value chain and logistics. Thus, the paper contributed and expands the knowledge among logistics or supply chain educators, researchers and practitioners. Following this introduction, the next sections of this paper provide existing differences starting with the conceptualisation and a snap shot of the evolution of Supply Chain, value chain, and logistics and the existing relationship among them. Finally, the paper identifies some differentials found about the discussed concepts, conclusion and recommendations.

2. METHODOLOGY

The study was library-oriented. The study used secondary literature review whereby the documentary review was used. Data was collected from published scholarly articles, published documents, books, and published theses related to the subject matter to achieve objectives of the study. The main sources of published articles and other electronic documents which were used for data sourcing from the keywords and thematic areas of the study were Google Scholar, various Enterprises' websites, Scopus, and Research Gate. Likewise, the reference books related to the study were taken from Moshi Co-operative University library. The topical keywords such as supply chain, logistics and value chain were used as primary data sourcing. The study succeeded to search and reviews 48 references related to study objectives. This paper conducted a deep synthesis of the collected literature, identifying themes relevant to the study.

3. FINDINGS FROM LITERATURE REVIEWS

3.1 Conceptualisation of terms

3.1.1 Concept of Value chain

Lysons and Farrington(2016) defines value chain as a linear drawing that shows how the value of the end manufactured goods and/or services is added through various steps right from the suppliers to the point of use including service after delivery. This implies that for every activity or step in the supply chain there is value addition to the product or service it moves across the chain from suppliers of production inputs to final consumers of finished products (Monczka, 2009). Value chain tries to demonstrate the full range of activities in a supply chain necessary to bring manufactured goods and/or service through to the point of consumption. These include but not limited to purchase of production inputs, processing, assembly and attainment of required services including transport, packaging and eventually feedback from consumer demand (Kumar & Rajeev, 2016). From this concept, it is too difficult to indicate demarcations that exist between value chain and supply chain.

Likewise, value was defined by Porter (1985) as the total of money that consumers can pay for the manufactured goods and/or services that the organisation offers. Profit tends to change when the value created by the firm is greater than the cost incurred in producing it. Kumar and Rajeev (2016) argued that,

it is very important to consider that value must be viewed from the consumers 'point of view because it is valuable to the most significant customer. Also, McGee (2010) stated that each value activity spends cost in acquiring materials and/or other services and physical goods for "production inputs," employee resources, and machinery to convert inputs into end products. For every activity that adds value to the end products, effective flow of information is required to inform about the progress in the business (Render, 2011). Likewise, Cooper (2014) added that value can be created by minimising accounts receivable, inventories, and optimum size of the order, but it is lost through raw material acquisitions and other liabilities. Furthermore, value can be created through physical supply and distribution (McGee, 2014). This creates place and time utility. From these descriptions you may notice that there are some logistics and supply chain activities mentioned in the concept of value chain.

3.1.2 Concept of logistics

Logistics originated as a military term dating back to the Napoleonic Wars, referred to as the modus operandi of moving and quartering armies – that is, quartermasters' work (Singhal & Ward, 2005). Now days in the area of business and economics, logistics refers to the practice of controlling and monitoring both the movement and storage of finished products, materials and persons from the point of supply (source) to the point of demand and the associated flows of information and cash flows (Rushton, Croucher & Baker, 2014). Raghuram and Rangaraj (2008) added that logistics is all about the planning, controlling and closely monitoring of all processes aimed at creating fulfilling customer's requirement.

The main focus of logistics in the field of business is cost-effectiveness and ensuring good customer service. Due to this, Rushton *et al.* (2014) came up with the suitable modern definition that is relevant to the majority of industries. Rushton *et al.* (2014), defines logistics as the efficient transportation of products and/or services starting from suppliers of materials through the factory and finally to the end customers in efficiently while offering satisfactory services to the clients. The activities involved in logistics include transportation, warehousing, materials handling, storage, packaging, physical distribution, inventory, procurement, managing flow of information and customer service (Raghuram & Rangaraj, 2008). Based on this logistics concept, it is evident that the overlap activities between logistics, SCM and value chain bring confusion among readers.

3.1.3 Concept of supply chain

According to Chandrasekaran (2010), supply chain is a connection of main business activities from the suppliers of suppliers that offer raw materials, services, and interrelated information to facilitate product value addition for consumers and other participants. Under this definition key business activities are identified broadly beyond the usual procurement, transportation and/or storage, and their incorporation. The basic aim of supply chain is to deal with key three flows in a supply chain namely; flow of materials, information and funds across the whole within and without the firm (Larson & Halldorsson, 2004).

Also, Lysons and Farrington (2016) defined supply chain as a complex system of linked and mutually dependent business enterprises working in harmony to monitor, manage and control the flow of goods and services from up streams to down streams users. The operation of supply network focus on effective collaboration and coordination among participants across the extended supply chain (Mchopa *et al.*, 2020). Furthermore, Christopher (2005) argued that supply chain is the managing of material flows in suppliers, manufacturers and customers relationships to deliver high consumer value at affordable price. The success of supply chain management is in mutual collaboration and trust among supply chain players, resulting in greater benefits as a whole than the sum of its parts (Raghuram & Rangaraj, 2008).

3.2 The evolution of Logistics, Supply Chain and value chain

3.2.1 The evolution of logistics and supply chain

The fundamentals of supply chain and the logistics have been original to the product development, storage and transportation of manufactured goods and related services. Early 1900s, logistics was thought as a military term (Ballou, 2006). Logistics entailed acquiring, care and movement of all military equipment, personnel and other facilities (Rushton *et al.*, 2014). Between the year 1950s and early 1960s, it was reported that the distribution systems were unplanned and unformulated. The logistics functions were fragmented which led to high logistics operation costs (LaLonde & Dawson, 1969). Due to recognition of high costs in logistics operations, one writer declares the most neglected area in the business of Americans is physical distribution (Drucker, 1962).

As such, the idea of physical distribution was introduced and realised between 1960s and 1970s whereby it was recognised that there was a chain of interconnected business activities such as transportation, warehouse, handling of materials and materials packaging that could be connected together and controlled in an effective way in order to minimise the operation costs (Maia & Cerra, 2009). One major transformation done in 1970s was some corporations recognised the necessity to include physical distribution management in the strategic management of the organisation structure (Murphy, 1972). Additionally, the decade observed changes in the configuration and close monitoring of the distribution network (Ballou, 2006). The concept of logistics was first introduced in the late 1980s and early on 1990s comprising of inbound and outbound material management (Rushton *et al.*, 2014). This helped to improve customer service due to advances in information technology.

However, in 1990's it was recognised that there are functions conducted by different organisations outside the logistics which also facilitate the provision of manufactured goods and service to ultimate consumer. So, there was a need to also integrate them with logistics activities for easy shipping of finished products to the market (Maia & Cerra, 2009). This led to introduction and recognition of new name called supply chain management which integrate other outside logistics functions. Between 2000 and 2010, supply chain and the logistics were documented as key areas for overall business success notwithstanding, the current and future challenges organisations have to deal with in the area of product distribution, logistics and management of supply chain activities (Rushton *et al.*, 2014).

3.2.2 The evolution of Value Chain

According to Fearné, Martínez and Dent (2012), there is evidence that the term value chain was first mentioned in the writings of Francois Quesnay in 15th century. The paper found that in 15th century, productive work and products manufacturing and profit were the basis for value chain creation (Fearné *et al.*, 2012). The reviewed literature indicated the first model explaining the concept of value chain was developed by Porter (1985). Consequently, it was Porter (1985), who publicised the idea of value chain. Likewise, Simatupang, Pairach and Williams (2017) argued that similar to several philosophies of enterprise management of that period, value chain model has been modified to fit dynamic business environment. Nevertheless, still more than 30 years now, the generic value chain model developed by Porter remains in existence.

3.3 The relationship between logistics, supply chain and value chain

The first connection between logistics and supply chain is on their origin; the findings revealed that supply chain has emerged from logistics. Maia and Cerra (2009) described that supply chain originated when companies started to expand logistics concept by thinking outside the organisation's boundaries. Also, they become aware of the importance and possible advantages brought by mutual relationships with suppliers and customers (Lambert *et al.*, 1998). Thus, the notion of integration relationship started to materialise, eventually led to occurrence of the supply chain concept (Lambert *et al.*, 1997). Similarly,

Rushton *et al.* (2014) found that historical evolution of the logistics caused the occurrence of supply chain as a broader concept. Therefore, it is evident that the close link between the two concepts cannot be denied.

A second connection between logistics and supply chain is on the activities carried out. Supply chains ensures a seamless forward and reverse flow of physical goods, services and information across all the supply chain participants (Lambert *et al.*, 1997). To Frankel *et al.*, (2008), supply chain activities include; sourcing of production inputs, warehousing, transportation, production, effective information sharing, and customer service. On the other hand, logistics deals with the effective and efficient storage and movement (in both directions) of products, services and information flows across the actors (Rushton *et al.*, 2014). In this sense, supply chain recognises all traditional logistics activities and includes other activities like marketing, finance and new product development among others (Hugos, 2006). Ideally, all logistics activities can be categorised under the supply chain. Therefore, it is impractical to say you are carrying out supply chain activities without logistics activities (Christopher, 2016). Maia and Cerra (2009) described that all logistics activities operate inside the structure of supply chain. Hence, logistics falls under supply chain (Monczka, 2009). Value chain is related with supply chain and logistics in such a way that the value chain encompasses all company activities which add to the value of the goods or services in the eyes of the purchaser (McGee, 2010). Therefore, in every activity conducted in the logistics or supply chain there is the idea of value creation of the end product or service delivered to the end customer (Lysons&Farrington, 2016).

3.4 The difference between logistics, supply chain and value chain

3.4.1 Scope or coverage

A review of literature by Hugos (2006) on the difference that exists between supply chain and logistics show that; logistics is within supply chain management which include activities such as transportation, warehousing, customer service, distribution and packaging and related information starting from the supply point and to the demand point to meet customers' requirements. Raghuram and Rangaraj (2000) argued that the physical scope of supply chain is enlarged to consider the entire gamut of activities from vendor to customer while the logistics function would typically look at a given task of movement and storage of goods. Similarly, Maia and Cerra (2009) described that logistics puts its concentration on activities such as acquisition of materials, physical distribution, repair and maintenance, transportation, warehousing and inventory control whilst supply chain do all logistics activities and take account of other activities such as research on new market, designing of new product, financial activities and customer services. According to Monczka, Giunipero& Patterson (2016), supply chain can be looked at as a subset of value chain. Monczka *et al.*, (2016), builds this argument on the basis that value chain includes both the primary activities and support activities at an organisational level. That is, every personnel in the organisation are part of the value chain, although supply chain concept does not reaffirm this. The figure 1 shows the scope and boundary between supply chain and logistics.

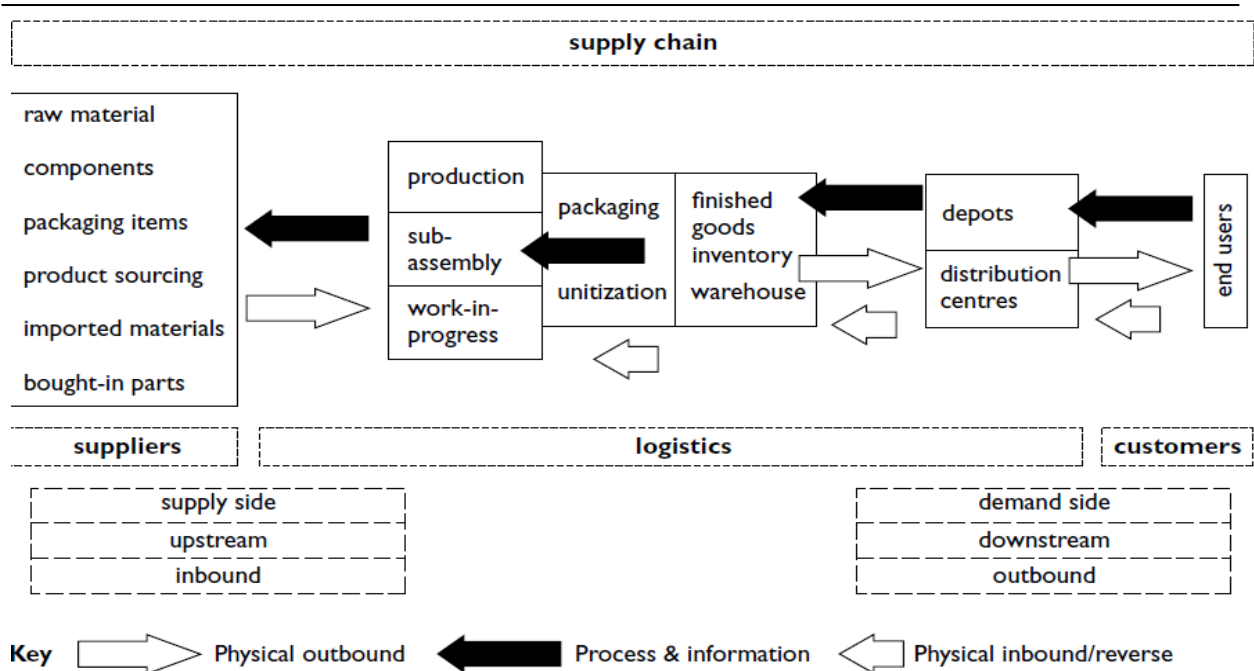


Figure 1: Comparisons between Supply chain and Logistics

Source: Rushton *et al.*, (2014)

From the figure 1 it can be concluded that Logistics = Materials Management + Distribution while Supply Chain = Suppliers + Logistics + Customers.

Although both value chain and supply chain extend the boundaries of one organisation, to include other organisations, value chain brings on board every stakeholder in the organisation. On the other hand, supply chain begins with procurement building its relationship with other departments in relation to their activities with procurement function. Given the basis upon which value chain concept was popularised in reference to Porter's model, Monczka *et al.*, (2016) argument can be given a benefit of doubt. Porter was focused on strategic management of a firm to gain competitive advantage. In strategic management, every facet of the organisation is imperative in realising the mission and vision set, hence capturing both primary and support activities. Similarly, provided that the goal of supply chain is to provide value to both the organisation in terms of profit and the customer on basis of perfect order, it can be argued that it is the operational part of the value chain (Monczka *et al.*, 2016). The figure 2 illustrates the scope of value chain as adopted from book of purchasing and supply management



The figure 2: Scope of value chain

Source: Porter (1985).

3.4.2 Number of Organisations involved

Literature review based on supply chain evolution by Mehmeti (2016) found that logistics are the activities which take place inside the borders of single organisation while supply chain involves more than one organisation. Supply chain involves multiple of organisations. Lysons and Farrington (2016) described that the supply chain involves vendors, producers, transporters, wholesalers, retailers and customers. All these organisations perform their functions independently and in autonomous way. Furthermore, all supply chain partners perform different functions that add value to the manufactured products from one partner to another throughout the whole supply chain. A study done by Justus, Mchopa and Kazungu (2021) found that acquiring the quality agricultural inputs such as seeds, fertilizer and other facilities from suppliers had influence on value addition. Therefore, value chain development is also involved, and depends on more than one organisation.

3.4.3 Objective to be achieved

Another difference between logistics, supply chain and value chain can also be identified in primal objective. Supply chain tends to focus more on cost reduction and flow of materials from destination to final users, leaving the customer satisfied (Feller, Shunk & Callarman, 2006). Conversely, value chain looks at every activity seeking to understand how it can add value to the final consumer, in a way it will enable the organisation to gain competitive advantage through improved profit margins (Feller *et al.*, 2006). In Porter's value chain model, all activities are pointing towards organisation profit margin. Although it can be assumed that organisation can only gain competitive advantage if the customers are satisfied, Porter (1985) does not make this the chief objective of the model. As such, whereas the objective of logistics is customer satisfaction and for supply chain is total cost reduction, the primal objective of value chain according to Porter's (1985) model is firm's profit margin.

The reviewed paper by Ghomrassi and Tigu (2017) on the influence of logistics in customer satisfaction found that the primary objective of logistics is to achieve the requirements of the customer. Likewise, a study by Maia and Cerra (2009) concluded that the basic purpose of logistics is to provide clients with a perfect order. On the other hand, the primary target of supply chain is to gain a superior competitive position in the industry (Hugos, 2006). Effectiveness, efficiency and quick responses on customer needs are key issues to consider in achieving the competitive advantage. The overarching aim of value chain is to satisfy the end user. Raghuram and Rangaraj (2008) described that if the firms fail to satisfy the needs of their clients, the clients will earlier or later twist to a different supplier. To Christopher (2005), development of value chain is regarded as a market-oriented approach. Thus, the supply chain gains competitive advantage through efficient and cost-effective orientation, which is not the case with value chain that aims at gaining competitive advantage through value addition, while logistics through customer satisfaction.

3.4.4 Origin

One of the distinctive marks between supply chain, logistics, and value chain is their origin. Ballou (2006) noted that supply chain originated from operations management while value chain comes from business management perspective. This explains why supply chain management concept tends to lean on integrated management of all firm's activities, with a focus on total cost reduction, quality improvement and customer satisfaction. On the other hand, value chain originates from business management perspective driving firms on how to gain competitive advantage in highly competitive environment. Explaining it better, Autry *et al.* (2008) state that value chain assumes business strategy view point, emphasizing on product design, and after sales services to gain competitive advantage, while supply chain is concerned with materials and information flow outlook focusing on suppliers, inventories and information flows. Besides, SCM differ from logistics in such a way that; logistics is an older term

compared to supply chain (Rushton *et al.*, 2014). A study conducted by Ballou (2006) on the evolution of logistics and supply chain found that logistics is the oldest term compared to value chain and supply chain terms.

3.4.5 Position of procurement

Baily *et al.* (2015) described that procurement plays a vital role in meeting company's objectives and customer needs. This justifies the reasons why it cannot fail to be mentioned in supply chain, logistics and value chain. Nevertheless, procurement in both logistics supply chain occupies a central position just as operations, finance and other functions are important. In fact, procurement provides the only link between the organisation and its suppliers, joining the upstream and downstream portions of supply chain. Value chain, however, views procurement as support function and not primary function (Feller *et al.*, 2006). Both Porter and Hines who developed value chain model fail to identify procurement as primary function (Porter, 1985). Peter Hines, only identify certain aspects of procurement such as material management as primary activity but does not recognise the entire procurement function which spans beyond material management as primary. In fact, Hine does not also identify procurement under support activities (Lysons& Farrington, 2016).

3.4.6 Direction of flows

Another obvious distinction between logistics, supply chain, and value chain is in the direction of flows. More often, logistics and supply chain are used to depict the flow of goods from the source towards customers (Lysons& Farrington, 2016). The supplier is mostly the source of the flows in the logistics supply chain. In value chain, flows originate from the customer. The customer creates value in form of demand and it flows to the supplier and it ends in final product (McGee, 2014). Thus, orders as well as cash (value) will flow from customers to the supplier forming the value chain. Feller *et al.* (2006) summarizes that supply chain majors on upstream activities, to synchronize vendors and producers' processes, reducing inefficiencies while value chain looks downstream, to create value for the final customer. While the major purpose of the supply chains is to get a perfect order to the customer, current supply chains are required to facilitate reverse logistics which may involve flow of products, finances and feedback from the customer to the supplier or supplier's supplier. Therefore, logistics and supply chain has flows in two opposite directions while value chain flows from the customer to the organisation.

3.5 The similarities between logistics, supply chain and value chain

Apart from the conceptual differences discussed above, there are common issues which shared among logistics, supply chain as well as value chain. These include; all terms focus on goods and/or services, seek to ensure fulfillment of customer's requirements, there is movement of goods and services across the participants, and final aspire of these terms is to enable the company to accomplish its mission and differentiate it from competitors (Christopher, 2016).

4. CONCLUSION AND RECOMMENDATIONS

From the above analysis, it is clear that there are conceptual boundaries that exist between supply chain, value chain and logistics. These boundaries are manifested in terms of origin, scope, objective and the role of procurement among other discussed issues. Supply chain tends to take on different objective depending on the subject. When comparing with value analysis, supply chain leans towards customer satisfaction rather than increase in profits of the firm. On another hand, supply chain objectives come out clear as one concern with overall competitive advantage of the supply chain partners, rather than the satisfaction of particular customer, which is the major objective of logistics. Notwithstanding, does this difference make a difference? Perhaps this is one of the overarching questions modern supply chain practitioners, academicians and other stakeholders need to be concerned about.

While the academic language has strived to bring out the gap that exist among supply chain, value chain and logistics, the overlapping roles and close connection between these concepts cannot be denied. What comes out clearly is that all the three concepts aim at adding value, not only to the product sold to the customer but also to the organisation in regards to increased profit margin. All aspects of logistics are covered in supply chain and logistics moves the raw materials from the procurement stage up to distribution when the product reaches the final consumer, this is what is described as the value-added aspect of logistics. So, whether logistics is subset of supply chain, and supply chain a subset of value chain, the most outstanding fact is the complementary role among them. In this case, this paper recommends that logistics and supply chain educators, researchers and practitioners should put more efforts on providing trainings on the controversial issues of supply chain, logistics and value chain.

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