

## Determinants of Supply Chain Management Practices in Organizations

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Getting people or organizations working together is currently one of the most critical things in our today's business environment. This is because competition has changed from being firm based to supply chain based. As firms work together to maximize supply chain profitability, it becomes apparent that relationships between the members of the chain have to be managed. This paper advances the view that superior supply chain outcome is achieved through the pursuit of collaboration, human resource practices and organizational culture which aid in strengthening the inter-organizational bonds of the various members. The paper is a conceptual paper which proposes a model of supply chain performance based on the combination of the different determinants identified through literature review. Essentially the main aim of the paper is to propose a framework of supply chain performance which needs to be tested through empirical research across different supply chains.

**Key terms:** *Collaboration, Human resource practices, Organizational culture*

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## Introduction

The key to an organization's success in our current business world lies in building and sustaining competitive advantage (Evans & Collier, 2009). Customer needs drive strong competitive advantage which is achieved through alignment of the organization's resources with its business opportunities. Slack et al (2007), assert that recent developments in the business front have created increased pressure for operations functions to develop rapid responses. Some of the business developments include increased cost based competition, higher quality expectations, demands for better service, more choice and variety among others.

Responses to the aforementioned pressures form the basis of the new operations agenda, the pursuit of five operations objectives namely; cost, quality, speed, dependability and flexibility. To realize the operations objectives, organizations have resulted to the search of new strategies like supply chain management (SCM) philosophy as a way to compete (Halldorsson et al, 2007). The basic purpose of a supply chain is to coordinate the flow of materials, services and information among the elements of the supply chain so as to maximize customer value through the attainment of the five operations objectives, (Evans & Collier, 2009). A firm's competitiveness is becoming more and more dependent on its capability to produce and deliver customized products fast and efficiently throughout the world. Bruce et al (2004) further argues that an increasing percentage of value creation for entities takes place outside the boundaries of an individual firm and in essence creates the necessity to understand how to manage collaborative and integrated operations.

## Operations Management and Supply Chain Management

The birth of Operations management (OM) as an independent area of management dates back to the end of the 1950s and early 1960s, when the first OM textbooks were published. OM then clearly became a discipline distinct from industrial engineering and operations research (Chase and Aquilano, 1992). As Evans & Collier, (2009) avow, Operations Management has evolved into one of the most important disciplines over the last several decades. Filippini (1997) notes that some writers in operations management in the 1970s adopted a broader perspective with a management-oriented approach.

The 1980s ushered in an era of recognizing the importance of certain subjects such as strategic management. Especially, topics such as process design and technology or operations strategy attracted more attention than in previous periods. Companies realized that productivity could be increased significantly by managing relationships, information and material flow across enterprise borders or managing a multi-organization coordinated operations network (Rudberg and Olhager, 2003). This resulted in the present concept of supply chain management. It therefore can be said that supply chain management is an advancement of operations management. It marked the departure from the tradition of managing individualized simple operations to managing collective and integrated operations of many entities in a chain, involved in managing the horizontal flows of material, information and financial resources which deliver value to the final customer. Further, organizations in a supply chain can be said

to form a meta-organization built up by independent organizations which have established inter-organizational relationships and integrated business process cutting across the individual business units in the chain, (Halldorson et al., 2007)

Operations Management and Supply Chain Management are two terms which have attracted a lot of controversy in field of management Science. Some scholars have argued that SCM is an independent area of management while others assert that SCM is a part of OM. Houlihan (1992), in attempt to trace the genesis of the term SCM state that SCM deals with managing an organization in the light of the activities, resources and strategies of other organizations on which it relies. It therefore implies that SCM deals with the operational concerns of an organization outside its boundaries of ownership which contribute to delivering value to the final customer. To summarize the debate on OM and SCM from the above literature review, it is very clear that SCM is a part of OM.

### **Supply Chain Management**

Definitions of SCM vary across many scholars of supply chain management, (Table 1.1). A deep synthesis of these definitions depict that SCM can be defined from three perspectives; a management philosophy, implementation of a management philosophy and finally a set of management processes, (Mentzer et al, 2001). The various definitions advanced and their categorizations point that the term “supply chain management” remains a knowledge area of great contestation and confusion for researchers and practitioners alike.

When SCM is viewed as a philosophy, a systems approach is used to view the supply chain. Thus, a supply chain becomes a single entity rather than a set of fragmented parts each performing its own function (Ellram and Cooper 1990; Houlihan 1988; Tyndall et al. 1998). It follows that the philosophy of supply chain extends the concept of partnerships and collaborative endeavors into an intra-firm and inter-firm effort to manage the total flow of goods from the supplier to the ultimate customer (Jones and Riley 1985). Cooper et al. (1997), in supporting Jones and Riley argue that SCM is a set of beliefs that each firm in the supply chain directly and indirectly affects the performance of all the other supply chain members, as well as ultimate, overall supply chain performance.

### **Supply Chain Performance**

Performance is the degree to which an operation fulfills the five objectives at any given point in time to fulfill customer needs, (Slack et al, 2007). Improving supply chain performance is critical because customer needs and preferences are not static, competition poses new challenges as time goes on and technology presents opportunities to produce and deliver better products and services. Supply chain managers have to frequently assess the performance of their supply chains to provide inputs for continuous improvement.

Measuring supply chain performance can improve overall business capability at both firm and industry level since it can enhance understanding and cooperation among supply chain members (Shepherd

and Gunter, 2006). Further, they argue that supply chain performance measurement provides feedback information to reveal progress, motivate members, improve chain communication and diagnose problems to facilitate inter-understanding and integration among supply chain members. This goes a long way in improving overall customer satisfaction as well as competitiveness and profitability of supply chain members.

### **Determinants of Supply Chain Management Practices and performance**

This section is detailed exposition of the various determinants of supply chain performance identified. The determinants discussed are; connectivity and integration of ICT systems, collaboration, knowledge sharing, human resource practices, organizational culture and trust.

### **Connectivity and integration of ICT systems**

Advances in information communication technology have greatly facilitated the uptake of supply chain management concept by many organizations. ICT is the backbone of collaborative endeavors in supply chains without which connectivity and sharing of information will be near impossible. Information shared with ICT systems creates competitive value by substituting for inventory, shortening order fulfillment cycle, speeding up new product design and coordinating supply chain management activities (Cachon and Fisher, 1997; Clark and Hammond, 1997). Information technologies enable organizations to collect, analyze and disseminate information among members of a supply chain to enhance decision making. Connecting managers across

different functional disciplines and organization boundaries and providing them with accurate and relevant information has enabled them to make better, timely and more collaborative decisions (Chesbrough and Teece, 2002).

### **Trust in Supply Chains**

Trust can be attributed to relationships between people or organizations. Humans have a natural disposition to trust and to judge trustworthiness (Kosfeld et al, 2005). For trust to occur, one party (trustor) is willing to rely on the actions of another party (trustee), a futuristic inclination characterized by great uncertainty of outcome. In addition, the trustor (voluntarily or forcedly) abandons control over the actions performed by the trustee. While the trustee has performance duty in the relationship, the trustor can only develop and evaluate expectations. The uncertainty involves the risk of failure or harm to the trustor if the trustee will not behave as desired (Mcknight and Chervany, 1996; Mayer et al, 1996).

Researchers on trust have broadly focused on three perspectives to build trust between supply chain members. The perspectives are characteristics based trust, rational trust and institutional trust. In characteristics based trust, the focus is usually on the characteristics of individual processes, economics, technology and institutional system on establishment of trust (Mayer et al 1995; Cumming and Bromiley, 1996; Morgan and Hunt, 1994; Kwon and Suh, 2005, Schoorman et al., 2007). Key characteristics considered in trust building process are perceptions, reliability, dependability, credibility, commitment, honesty, benevolence, fairness, goodwill and emotions.

For rational trust, economics of relationship, dynamic capabilities of partners and technology adoption are crucial considerations (Williamson, 1993;Lippert and Swiercz, 2005). From the rational choice perspectives theory, decisions made on trust considerations are presumed to be motivated by rational efficient choice (i.e to maximise expected gains or minimise expected losses from their transaction). Trust is deemed to take center stage in conditions of ignorance of some aspect of the negotiation or interaction and hence there must be a rational reason to trust.

Last trust perspective is institutional trust. Members in a supply chain institute trust through legal frameworks, commercial law, control system, agreements and contracts (Kramer, 1999; Das and Teng, 2001; Child and Mollering, 2003). Other researchers, Shapiro et al. (1992), proposed the notion of deterrence-based trust. They argue that actors act in a trustworthy manner because of the fear of the consequences of trust violation. Trust has a positive influence on interorganizational knowledge sharing (Cheng J et al, (2008). Without trust in a collaborative endeavour, information exchanged or knowledge shared between partners may be low in accuracy, (Currall and Judge, 1995). Moreover, it may also lack currency or be less in content and hence create less impact to the user of the information or knowledge.

### **Knowledge Sharing in Supply Chains**

Knowledge sharing is an activity through which knowledge i.e information, skills or expertise is exchanged among people, friends or organization (wikipedia). Knowledge constitutes a valuable intangible asset for creating and sustaining competitive advantages (Miller and

Shamsie, 1996). Knowledge sharing activities are generally supported by knowledge management systems. Technology constitutes only one of the many factors that affect the sharing of knowledge in organizations. Other factors which facilitate knowledge sharing are organizational culture, trust and incentives. The sharing of knowledge constitutes a major challenge because employees tend to resist sharing their knowledge with the rest of the organization (Bock and Kim 2002). Dalkir (2005) identified the common risk in knowledge sharing as rewarding individuals on the basis of what they know, not what they share. If knowledge is not shared, negative consequences such as isolation and resistance to ideas occur. Shared knowledge offers different viewpoints and possible solutions to problems.

Supply chains are formed to achieve cooperative competitive advantages of all the parties concerned. To achieve this objective inter-organizational knowledge sharing among the members involved becomes overly crucial. With effective knowledge sharing, the strategic intents of members can easily be attained by combining relevant organizational resources and capabilities (Madhok and Tallman, 1998). Loebecke et al, (1999) assert that knowledge is a great source of competitive advantage but firms only share knowledge if sharing benefits outweigh the losses realized by relinquishing their monopoly over the knowledge.

### **Collaboration and Supply Chain Performance**

Collaboration in a supply chain occurs when two or more organizations in a supply chain work together to plan and execute supply chain activities jointly

(Simatupang and Sridharan, 2003). Firms collaborate when their relationship is characterized by openness and trust, where risks, rewards and cost are shared (Sandberg, 2007). Trust in a supply chain does not come into existence spontaneously. It is driven by perceptions of credibility (i.e partners have the expertise to perform tasks effectively) and benevolence (i.e partners have intentions and motives that will benefit the relationship). Supply chain performance is perceived to be improved through collaborative efforts of the partners, actions which lead to reduced inventory, reduced costs, improved customer service, improved forecasts and on time deliveries (Waller et al., 1999; Whipple and Russell, 2007).

Whipple and Russell (2007), identified three types of collaborative relationships, namely Type I, Type II and Type III. Firms embracing Type I are majorly on transaction management mission and their transactions are characterized by high-volume data exchange facilitated by ICT initiatives like Electronic Data Interchange (EDI) and Vendor Managed Inventory (VMI). Task alignment for such firms is purely operational, building data integrity is key and standardizing information exchanged is fundamental. On the other hand, Type II collaborative involves event management characterized by joint planning and decision making activities like new product introduction/new store openings, new business plans and sales promotions. Interpersonal interactions between collaborators become crucial and transactional data is not necessary. Lastly, Type III collaborations involve joint problem solving, long-term process planning and more fully integrated supply

chain processes such as manufacturing scheduling, truckload utilization, warehouse management and order forecasts/replenishment. It can then be summarized that Type I, falls within operational/transactional level while II and III collaborations are a reflection strategic based collaborative endeavors with ICT seen as a major enabler. Type I collaborations have been found to exist more than Type II and III in many organizations (Whipple and Russell, 2007).

### **Bonding in Supply Chain through Human Resource Practices**

Successful supply chains thrive on the ability of the adopters to develop specific capabilities (Chandra and Kumar, 2000). Some of the capabilities include the ability to; develop a flexible organization, develop a trusting relationship with its suppliers, seek total supply chain coordination and enhance communication to reduce uncertainty and inventory levels. Other capabilities are the ability to outsource non-core competencies, reduce cost, reduce inventory and implement build-to-order manufacturing. While some capabilities are delivered through investing in new plants or ICT systems and other related technologies, other capabilities are delivered by people, the employees in the various supply chain members. Congruence of capabilities among staff across the chain is necessary for synergy and amplification of key competencies developed early in the chain.

Companies termed as effective in their SCM practice put a lot of emphasis on developing their human resources through training and retraining of their employees (Gowen and Tallon, 2002). These entities

develop specific skills among employees like problem-solving skills, leadership skills, team-building skills and job skills. Further, Shadur and Bamber (1994) affirm that effective SCM practice also rely on teamwork and continuous improvement. Teamwork is critical because it enables pooling of resources and expertise for faster trouble shooting and support improvement. Collaboration is necessary in SCM and its key ingredient is trust. Trust is delivered by people and it is therefore necessary that trust building practices are shared by supply chain members (Basu and Miroshnik, 1999). They also point out that HRM system needs to emphasize extensive skill development, worker adaptability and high motivation and hence suppliers in a supply chain are expected to develop similar HRM practices in order to support the emphasis on collaboration along the chain.

### **Organizational Culture**

Schein, (1992) defines culture as a pattern of shared basic assumptions that a group learns as it solves problems of internal integration and external adaptation, that has worked well do be considered valid and hence be taught to new members as the correct way to perceive, think and feel in relation to issues. The basic underlying assumptions are unconscious, taken-for-granted beliefs, perceptions, thoughts and feelings. Analyzing and changing organizational culture is an intricate task because assumptions can only be inferred from what can be seen or heard in organizations though some degree of visibility is attained through artifacts and espoused values (schein, 1992).

Espoused values are audible and spoken. Organizations convey real evidence of

espoused values through their goals, philosophies, sayings, slogans, acronyms, greetings and strategies. More espoused values are captured through legends, myths and shared stories of organizational heroes. On the other hand, artifacts are visible and physical e.g dress code, newsletters, signs, banners, office and status symbols. As Schein, (1992) argues, many artifacts and espoused values are “wish lists”, representing a desired culture that may be quite different from the true culture and hence resulting to a cultural misalignment.

Researchers have looked at various types of culture and how each type affects relationships management. Hofstede (1991), advances the view that collectivism versus individualism (self interest) cultures shape the way a people in a nation interact and hence do business. Collectivism culture has strong developmental foundation. It exists in societies in which people right from birth onward are integrated into strong, cohesive in-group, which throughout people’s lifetime continue to protect them in exchange for unquestioning loyalty. Nisbett et al. (2001) argue that the social differences that exist among different cultures affect not only their beliefs but also naive metaphysical systems, their tacit epistemologies and nature of their cognitive processes. They further stress that the cognitive differences between ancient Chinese and Greeks can be categorized under holistic versus analytic thought processes respectively. Holistic thought process is oriented to the context as a whole including attention to relationship while an analytic mindset detaches the object from its context and focuses on attributes of the object

preferring use of rules to explain and predict the objects behavior.

Collectivists like the Chinese place group goals and collective action ahead of self interest. They gain satisfaction and feelings of accomplishment from group outcomes. In the Chinese society, the interest of the family is put before individual interest (Liang, 1949; Lin, 2001). The family orientation is more of a collective culture which is specifically referred to as familistic collectivism (Yang, 1992). In the west, self-interest is placed above group interest. Pursuance of self interest is further based on power dependence. If an individual is dependent on or has no power over the other, he or she cannot pursue self-interest (Emerson, 1962). Western organizations are governed by formal arrangements and institutional frameworks. Scott, (2001), notes that institutional influences operate under three pillars. The pillars are; regulative (regulatory structures, government agencies, laws, courts and professions), normative (values, norms and rules) and cultural-cognitive conception of institution.

Supply chain management is about relationships management. Integration is key if collective goals of the whole supply chain are to be attained. It's however worthy noting that members in a supply chain are individual entities which are also managed to pursue individual organization goals. Interplay of two cultural orientations is therefore bound to exist naturally in managing supply chains, collective culture and individualistic culture. Pursuance of individualistic culture leads to sacrifice of supply chain goals at the expense of individual goals

and hence culture alignment may be very necessary for superior supply chain performance to be realized.

### **Empirical research on determinants of supply chain performance**

Several scholars have looked at determinants of supply chain performance. Olorunniwo and Li (2010) investigated how a company's performance is impacted by the use of information technology and supply chain management initiatives (information sharing and collaboration). The study findings revealed that information sharing led to greater collaboration in reverse logistics and enhanced the reverse logistics performance of 600 United States companies. Crone and Roper (2002) further propose other determinants of supply chain performance. They argue that knowledge sharing and learning have increasingly become key determinants of supply chain performance. In supporting Crone & Roper, Holland (1995) assert that inter-organizational coordination and product quality improvement demand that supply chain partners implement common processes which require sharing of process knowledge.

Othman and Ghani (2008) did a study in Malaysia to investigate the impact of supply chain management (SCM) on the HRM practice of suppliers. They argue that the performance requirement in an SCM system requires that suppliers develop specific HRM practices. Successful adopters of supply chain management concept thrive by developing specific capabilities. Chandra & Kumar, (2000) indicate the capabilities as; developing a flexible organization,



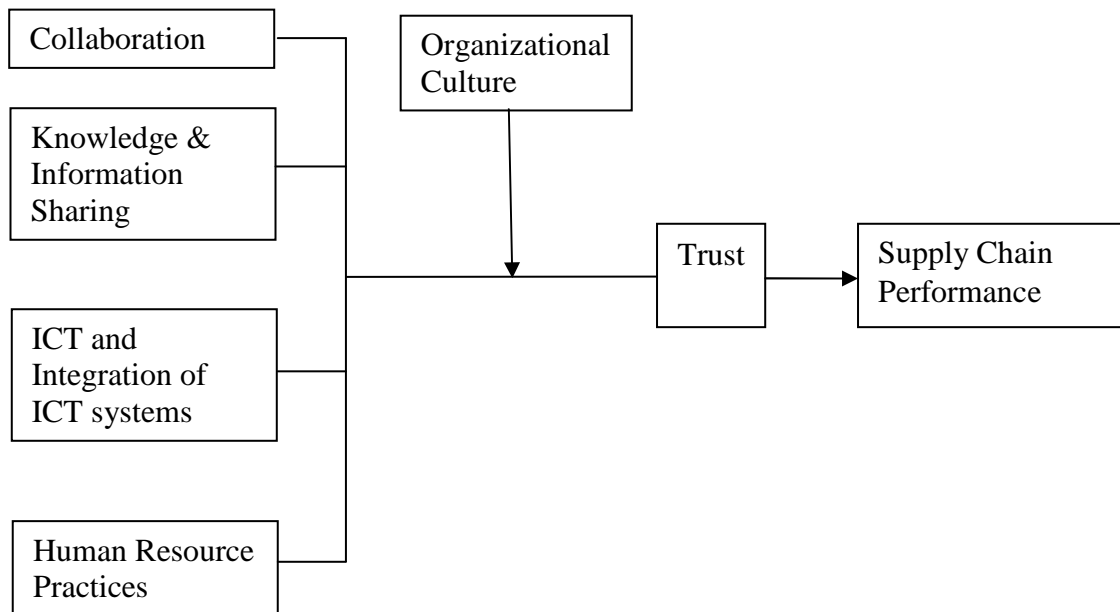
developing a trusting relationship with suppliers, enhancing communication among others. These capabilities require employees who are multi-skilled, adaptable to reorganization, are flexible in their roles and are able to work in boundary-spanning responsibilities. This leads us to another determinant of supply chain performance, supplier's human resource practice. In supporting this view point, Gowen and Tallon, (2002) further argue that companies said to be effective in their SCM practice put a lot of emphasis on developing their human resources through training and retraining of their employees.

Leeuw and Fransoo (2009) carried out a study on drivers of close supply chain collaboration in Western Europe. They based their work on recommendations by Goffin et al. (2006) who maintain that antecedents of close supply chain collaboration remain unclear. From the works of Leeuw and Fransoo, three drivers of supply chain collaboration were identified; market characteristics, partner characteristics and product characteristics.

Close collaborations in market conditions of uncertainty are considered beneficial while in strategic partnerships, collaboration may work well if there is a dominant partner perceived more powerful to influence the decisions of others. The key aspect of product characteristics is item criticality. An item is deemed critical if; it adds high value in product line, the percentage of raw material in total costs is

high, it faces supply scarcity or faces by monopoly or oligopolistic supply conditions (Kraljic, 1983). Further, item criticality can be by technical complexity, uniqueness of technology, frequency of design changes and the level of customization required (Bensaou, 1999). The study by Leeuw and Fransoo confirm that collaboration is a key driver of supply chain performance and drivers of close collaboration in each supply chain needs to be established.

Plenty of literature exists on determinants of supply chain performance. Some of the determinants noted are human resource practices of supply chain members, knowledge and information sharing and level of collaboration among the supply chain members. The interplay of these determinants in explaining supply chain performance is virgin ground for supply chain research. Furthermore, measuring supply chain performance without measuring interrelationships that exist among the various supply chain members may not provide useful insights into what needs to be done to improve supply chain performance. In conclusion the determinants of supply chain management deemed vital in determining SC performance are hypothesized to relate as summarized in figure 1;



**Figure 1: Determinants of supply chain performance**

### Conclusion

This paper has made an attempt to uncover the various determinants of supply chain management cited in literature. These determinants are ICT and integration of ICT systems, collaboration, knowledge sharing, information sharing, human resource practices, trust and organizational culture. As discussed in chapter two, empirical studies have been done in limited areas to explain the contribution of each of the mentioned concepts.

Exploration of supply chain literature reveals a number of issues, a summary of which follows. First papers reviewed indicate that all research on determinants of supply chain performance in the past was done in other continents other than Africa. Secondly, all studies done covered the impact of one determinant eg information sharing on supply chain

performance and hence no study has been done for the literature reviewed addressing the combined effect of several determinants on supply chain performance. Lastly, not all sectors of an economy were addressed in the previous studies reviewed; e.g health sector and agriculture sector need to be studied.

### Recommendations

Supply chain management has been embraced by many organizations world over. To improve supply chain performance, factors that integrate supply chain members strongly need to be embraced. This independent study paper recommends the following for further research;

- 1) More empirical research needs to be done on the contribution of each determinant on supply chain performance

and especially in Africa where such studies seem to be missing.

2) The determinants of supply chain performance may vary across sectors of an economy or may be product specific and hence future research should focus on the variability of determinants across different sectors of an economy or products.

3) The role of organizational culture seems paramount in determining supply chain integration. Future research should focus on uncovering which type of organizational culture is ideal for supply chain given that supply chain members are different organizations with different cultures.

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