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SUPPLY CHAIN MANAGEMENT AND THE ACCOMPANYING PROBLEMS IN PRODUCTION ENVIRONMENT: A REVIEW

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ABSTRACT

In production environment, supply chain system is a tool for attaining efficient production performance because it streamlines and optimizes the entire production processes. It appears that research efforts so far only supported arguments for the benefits of supply chain management in production environment without taking into account problems associated with the administration of supply chain system within production setting that constitute impediment to production throughput and make it difficult for manufacturers to satisfy customers' demands. Consequently, the aim of the review effort is to highlight the importance of supply chain management and identifies the underlying bottleneck problems related to supply chain administration in production setting to guide stakeholders in policy formulation for further production performance. Notable among the problems identified that are attributable to supply chain organization in production environment are, supply disruption, lack of agility to respond to supply and demand fluctuation, inadequate logistics, lack of adaptation to evolving market, inaccuracy of information between the extended enterprises, ineffective integration and coordination of supply chain strategy across the functional units, lack of capacity and resources availability, lack of quality and regulation compliance. Based on the identified problems, we developed a supply chain appraisal tool for pre-qualification and selection of supply chain vendors in production environment.

Keywords: Supply chain; problem; production environment.

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1. INTRODUCTION

Production processes involve conversion of raw materials to intermediate input or final products and distribution to the consumers. The importance of supply chain system in production system

cannot be over emphasized because it plays the key roles of ensuring smooth flow of materials and information, storage and distribution through all the stages of the production processes from raw material delivery to the manufacturer for transformation to distribution of the finished products to the final consumers as depicted in figure 1.

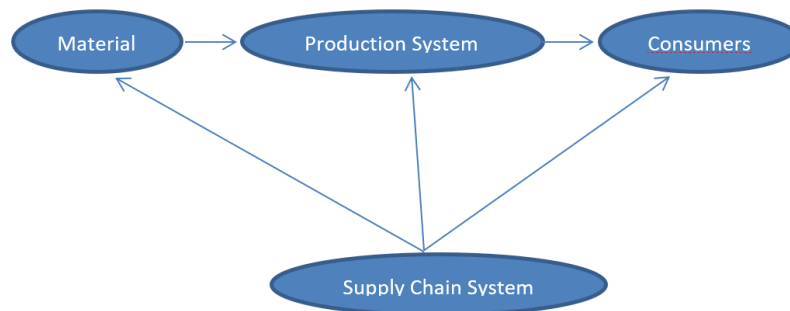


Figure 1 Relationship between Production and Supply Chain Systems

It is evident in figure 1 that the supply chain organization plays midway role between sources of raw material and the production system; similarly, it plays the same intermediary task between the production system and the final consumers. An ideal supply chain structure as depicted in figure 1 optimizes cost through inventory level and synchronizes supply of raw materials to production facilities for processing into intermediate or finished products and delivers the intermediate or finished products to the final consumers. However, in the relationships that exist between production system and supply chain organization, there are problems associated with supply chain system that limit the overall performance of the production system. Consequently, this literature valuation effort seeks to identify the underlying problems accompanying supply chain organization in production setting that constitute impediment to the overall performance of production processes and integrate it into a document to guide production planning and policy formulation for improved and efficient production system.

The first part of the review introduces the general topic to illustrate the situation while the second segment discusses the track of current progress to highlight the importance of supply chain in production environment and identify the underlying problems associated with supply chain in production setting; the third part synthesizes the literature into a document and the final section presents conclusion of the evaluation with recommendation for future research direction.

2. SUPPLY CHAIN MANAGEMENT IN PRODUCTION ENVIRONMENT

Several studies in supply chain management have emphasized the importance of distribution among producers, traders and consumers of goods. For instance, [1] asserted that manufacturers and buyers are confronted with need to physically distribute products because products are of no value to the buyers unless they are located in such a way that provides customers the chance to enjoy the physical attributes related to ownership of the product. Hence, there is need for physical movement of products from one location to another in production setting to enable consumers enjoy the value therein the product. It is the primary responsibility of the supply chain organization to move products either in the form of raw materials, intermediate input or finished products from one location to the other but a situation where the physical distribution of products is inefficient, it will limit production performance and result in production loses. Furthermore, [1] explained that as civilization progresses from rural primitive to industrialized urban, manufacturers and consumers become more broadly separated, therefore, the need for

distribution of products turned out to be of greater importance in the exchange of products between manufactures and consumers.

According to [4], supply chain has the ability to contribute to the improvement of production performances; therefore, inability of the supply chain system to fit in well into the production setting will limit the overall performance of the production system. In addition, [2] explained that quality performance, delivery reliability, cost effectiveness, volume plasticity, and rapid delivery system are very important inputs to the supply chain partner selection process in production environment to minimize likely impediments that may affect the production system. Supply chain stresses collaborations among marketing, logistics, and production system where it provide logistic channels across the entire production system such as between suppliers of inputs, the production system and final consumers of finished products. Also, supply chain integrates together inbound and outbound movements of products across organizational boundaries of a production system [3] asserted. However, ineffective logistics structure will hamper productivity in production system.

According to [4], manufacturers who do not collaborate with supply chain system may lose to competition in terms of prices and product quality, that supply chain has the potential to support the production system in accomplishing cost and added value advantage. Supply chain enhances performance by integrating and coordinating the internal functions within firms and connecting them with the external operations of suppliers and customers, however, to implement a viable supply chain system, firms must relatively integrate, coordinate and collaborate across organization and throughout the supply chain functionalities [4] affirmed.

According to [8], enterprise logistics is a necessary tool for the coordination of supply chain operations but for a true network structure, enterprise logistics integration only cannot guarantee improved organizational performance. Furthermore, [8] stressed that traditional logistics practices that integrate productive activities within the factory are essential but not enough for competitive success; therefore, the current logistics practices must connect production and logistics processes in different organizations geographically. The measures of performance in production environment attributable to supply chain are mainly operational and financial performance. In addition, [8] Expounded that performance in terms of efficiency and effectiveness of the structure of the production setting and the logistics procedure in collaborative effort reflects capabilities of the production system and logistics relating costs, speedy delivery, reliability, quality and flexibility. The financial performance include, market share, return on investment and sales growth. However, if the supply chain system is unable to fitting well in the production system, the production system will be less competitive and operate at loss. Supply chain covers integration of core processes across organizational boundaries through improved communication, partnerships and cooperation but effective implementation processes is critical for the success of extended enterprise [24] emphasized.

[26] Observed from their study based on supply chain quality policies that firms with high quality practices outperform firms with low quality practices in terms of cost savings, productivity and volume sales and earnings. This indicates that overall manufacturing performance can be improved through supply chain quality management.

3. PROBLEMS ARISING IN SUPPLY CHAIN MANAGEMENT IN PRODUCTION ENVIRONMENT

There is growing evidence that though supply chain is central to overall performance of production system, there are problems attributable to supply chain in production setting. For example, [9] claimed that BMW automobile manufacturer in Germany, China, and South Africa sometime stopped production of some of its series because of failure to supply steering gears

to it by its supply chain partner which caused the organization huge financial loses. This scenario demonstrated the importance of supply chain in production environment that effective supply chain system help manufacturers to avoid production disruption. Different challenges confronting supply chain finance were investigated by [5] and it was noted that lack of common vision among the supply chain partners, irregular cash-flows due to delays in financial transactions along with lack of knowledge and training on supply chain financial tools are critical to supply chain operations. The outcome of survey of supply chain practice by [6] to identify the present situation in UK industrial enterprises indicates lack of adaptation to the modern collaborative e-supply chain practice which is needed to improve performance and competitive position of firms. Frequently, organizational bottlenecks between supply chain facilities do occur and flow of information can be limited such that total centralized control of material flows in a supply chain may not be achievable [7] explained.

Among supply chain management problems identified by [10] are, conflict, delays, demand fluctuations, excess/unused resources, inaccuracy, insufficient resources, long tail, pricing, and security. In addition, [11] argued that supply chain problems include, lack of agility to respond promptly to abrupt changes in demand or supply, lack of adaptation as market structures and strategies evolve, and lack of alignment of the interests of all the firms in the supply network to optimize performance. [13] Claimed that supply networks firms looked for their own interests and ignored those of their network partners which consequently lead to supply chains poor performance in production environment. However, stakeholders in the industry are looking for best ways to deal with complexity of supply chain task therefore [14] supply chain cannot be left to chance because of the consequence of non performance of the network. [15] Noted that the generic problems in supply chain are, capacity and resources availability, complexity of products, supply chain risks such as natural disasters, compliance in terms of quality and products regulation and costs structure of the network among other problems.

Amongst different challenges faced by manufactures, one major problem is supply chain disruption [16] which causes production delay. Other problems include, integrating the structures of the supply chain strategies with the overall corporate business strategy and information sharing [16] noted. According to [17], supply disruption is caused by social and cultural matters. [18] asserted that ineffective supply chain integration of the extended enterprise constitute problem in production environment. Supplier capability evaluation in terms of technology quality, responsiveness, dependability and cost [19] are vital and where there is inadequacy, it will contribute to problem in production setting. [20] Claimed that barriers to knowledge sharing in inter-enterprise setting are, technology availability, organization's resources and people in terms of internal resistance, self-interest, trust and majority of the barriers are attributable to people issues. [21] Emphasized that supply chain management is a means to attaining competitive advantage in production setting but there is lack of effective integration of trust, manufacturing flow management, commercialization and product development, information technology, agile supply chain structure which are important in improving organization performance. Warehouses play important part in mitigating variations in supply and demand, however, lack of integration of transportation and inventory plans results in a significant variation in workload in the warehouse of industry partners costing them millions of dollars [22] claimed. The major problems between supply chain and manufacturing system according to [23] are supply disruption risk; inaccuracy of information between the extended enterprises; uncertainty of supply and demand and regulatory compliance. [25] Emphasized that transport is among the most critical problems facing supply chain system. According to [27], attempt by firms to integrate and implement total quality management, supply management, client focus policy, and other fundamentals to attain competitive success have failed to yield anticipated results; this argument suggests that effective integration and implementation of supply chain strategy is critical to the success of the

production system. Furthermore, [28] asserted that both strategic collaboration and lean practice; outsourcing and multiple-suppliers have positive impact on operational performance buttressing the argument that effective supply chain enhances production performance, thus, supply chain problems should be identified and remedied to enhanced productivity.

Some authors have suggested solution to supply chain problem. For instance, [12] explained that supply chain performance can be enhanced through integration of material and information flows between the extended enterprises. Thus, effective integration of the extended enterprises and forecasting may offer solution to supply chain problem in production environment. Similarly, in the study of supply chain in relation to organizational performance by [29] demonstrated that higher levels of supply chain practice can lead to improved competitive advantage and enhanced organizational performance. Thus, practicing standard supply chain management among the extended enterprises leads to high productivity in the industry. Furthermore, [30] argued that a company's integrated information system capability and the corresponding effects of information system capacity with manufacturing, marketing, and supply chain processes, are noteworthy predictors of manufacturing performance. This finding strengthen the argument for effective integration of the entire inter-organizational functions of the extended enterprise to optimize overall performance in production environment

4. CONCLUSION

It appears from the foregoing that there is no holistic document on the problems accompanying supply chain management in production setting; thus, the information provided by this review will guide manufacturers and supply chain organizations on appropriate policy formulation for efficient collaboration between the extended enterprises for further improved production performance. Also, the track of current progress in supply chain management demonstrates that there is adaptation from the old tradition to e-supply chain. Furthermore, the importance of supply chain management in production environment cannot be over emphasized because it enhances overall production performance. However, there are myriad of problems attributable to supply chain management in production setting, notable among them are, physical distribution challenges, quality performance, delivery reliability, cost effectiveness, agility to respond to supply and demand fluctuation, inadequate logistics, lack of common vision among the parties. In addition, other problems include, delays in financial transactions, lack of adaptation to changes in the market, organizational bottleneck within the supply chain facilities, inaccuracy of information between the extended enterprises, , ineffective integration and coordination of functional units, capacity and resources availability, quality and regulation compliance and supply disruption among others.

Table 1 is developed from the central problems associated with supply chain in production environment designed for supply chain vendors pre-qualification and selection.

Table 1 Supply Chain Appraisal Tool

S/N	Performance Variable	Score (%)
1	Delivery reliability	
2	Supply disruption risk	
3	Regulation compliance	
4	Quality compliance	
5	Agility to respond to changes in demand or supply	
6	Logistic and physical distribution	
7	Cost effectiveness	

S/N	Performance Variable	Score (%)
8	Financial transactions	
9	Adaptation to evolving market	
10	Integration and coordination	
11	Resources and capability	
12	Accuracy of information	
13	Technology	

The problems identified in the literature appraisal provide insight for stakeholders on how to alleviate supply chain problems in production environment for enhanced production performance. We recommend further research to test the efficacy of the supply chain appraisal format depicted in table 1.

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