

Supply Chain Management for Residential Buildings: An Overview

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ABSTRACT: Supply chain management (SCM) is a concept that has flourished in manufacturing, originating from Just-In-Time (JIT) production and logistics. Today, SCM represents an autonomous managerial concept, although still largely dominated by logistics. SCM endeavors to observe the entire scope of the supply chain. All issues are viewed and resolved in a supply chain perspective; taking into account the interdependency in the supply chain. SCM offers a methodology to relieve the myopic control in the supply chain that has been reinforcing waste and problems. Construction supply chains are still full of waste and problems caused by myopic control. Comparison of case studies with prior research justifies that waste and problems in construction supply chains are extensively present and persistent, and due to interdependency largely interrelated with causes in other stages of the supply chain. The characteristics of the construction supply chain reinforce the problems in the construction supply chain, and may well hinder the application of SCM to construction. Previous initiatives to advance the construction supply chain have been somewhat partial. The construction industry has been slower than other industries to employ the Supply Chain Management (SCM) concept and develop models that support the decision-making and planning. The peculiarity of the infrastructure projects is that it is in open environment activity and every project has different sets of constraints and limitations. Therefore, implementation of supply chain is little more difficult task as compared to the manufacturing industry. This paper will highlight the role of SCM in infrastructure construction projects with the help of cases from related fields and its practicability in implementation for better performance and successful execution of such projects.

I. INTRODUCTION

The best companies around the world are discovering a powerful new source of competitive advantage. It's called supply-chain management and it encompasses all of those integrated activities that bring product to market and create satisfied customers. The Supply Chain Management Program integrates topics from manufacturing operations, purchasing, transportation, and physical distribution into a unified program. Successful supply chain management, then, coordinates and integrates all of these activities into a seamless process. It embraces and links all of the partners in the chain. In addition to the departments within the organization, these partners include vendors, carriers, third party companies, and information systems providers. Within the organization, the supply chain refers to a wide range of functional areas. These include Supply Chain Management-related activities such as inbound and outbound transportation, warehousing, and inventory control. Sourcing, procurement, and supply management fall under the supply-chain umbrella, too. Forecasting, production planning and scheduling, order processing, and customer service all are part of the process as well. Importantly, it also embodies the information systems so necessary to monitor all of these activities. Simply stated, "the supply chain encompasses all of those activities associated with moving goods from the raw-materials stage through to the end user."

II. LITERATURE SURVEY

According to the Department for Business, Innovation and Skills [DBIS] (2013), the Latham's report, "Constructing the Team" which was published in 1994 as a result of the downturn in the construction industry recommended the adoption of SCM principles towards enhancing the behavior and performance of the industry with particular reference

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to matters related to unfair conditions, payment and dispute resolution processes. The views of Akintoye et al.(2000) was further corroborated by Saad et al.(2002) who opined that despite the existence of barriers to the implementation of partnering ideas in construction, a good number of practitioners in the industry have started moving towards the adoptions of SCM. Hope (2012) opined that with the desire to alter and promote innovation within the construction industry was hatched in the Latham's and Egan's reports.

Annelie et al. (2013) evaluate cost savings in supply chain with the help of two examples from Ericsson in the Telecom industry. This paper shows how a simple framework can be used when evaluating changes in a supply chain. The framework is built on Supply Chain Cost (SCC) model and customer service measurements, delivery precision and lead time.

Sonja et al. (2006) explain the SCM concept in building and construction industry. The author takes a case study of Australian residential sector for his research. The paper aims to find out what does SCM means in select organizations and what role partnership, trust and bonding play in improving the organizations competitive advantage.

Saad et al. (2001) provides a review on the adoption of SCM in construction industry and suggest that construction experts has some knowledge of SCM, but still they need more attention towards the implementation of SCM by increasing their conceptual understanding and how new SCM can be implemented systematically. This paper examines the early progress towards the adoption of SCM relationships in construction.

Trkman and Groznik (2010) present the current issues and problems facing by the industry while adoption of supply chain management. Their study reveals the common issues and problems like risks, business process renovations, trust buildings, lack of leadership and so on. They also highlight the SCM standard that provides guidelines to face these kinds of challenges.

According to (**Benton and McHenry, 2010**) SCM offers promise for the construction industry, however, intense implementation challenges, prevents effective implementation of supply chain benefits and proves detrimental to any planned operational efficiency advantages. The barriers of construction supply chain which hinders not only the development of integrated supply chain but also makes the execution of the projects extremely difficult such as failure to share project information, fear of loss of control, lack of awareness, lack of understanding the project requirements, lack of understanding the supply chain, myopic thinking and strategies etc. While complete supply chain management may be out of reach for most construction firms, application of its concepts will improve their competitiveness

III. PROPOSED METHODOLOGY

The construction industry is considered to be an engine in the national economy, accounts for about six percent of GDP (Gross Domestic Product) in Indian economy. It is a large, mature business and it has many important links to the rest of the economy. The construction industry in general is highly fragmented with significant negative impact such as perceived low productivity, immobility, cost and time overrun, conflicts and disputes resulting extra claims, time consuming litigations, quality deviations, poor health and safety management and many more. These have been acknowledged as the major causes of performance related problems faced by the construction industry (Bane et al., 2008). The legacy of this high level of fragmentation is that the project delivery process is considered highly inefficient in comparison with other industry sector. To remove these inefficiencies and also to have the total integration of entire process of construction, it requires the application of Supply Chain. management (SCM). The application of SCM is a means of developing both horizontal and vertical integration with the design, construction and operation so as to maximizing opportunities to add value while minimizing the total cost. This application requires a significant mind set of the customers, collaborators, consultants, main contractor and other team members for mutual benefits. There are three types of flows associated with the SCM: -

Material flow: involves physical product flow from the suppliers to customers through the chain as well as the reverse via product return, recycling and disposal,

Information flow: Demands forecasts, order transmission and generating delivery status report,

Cash-flow: involves commercial information, payment schedule, consignment details and ownership arrangements

Figure 1 shows typical Construction SCM indicating the upstream and downstream flows of money, work and information

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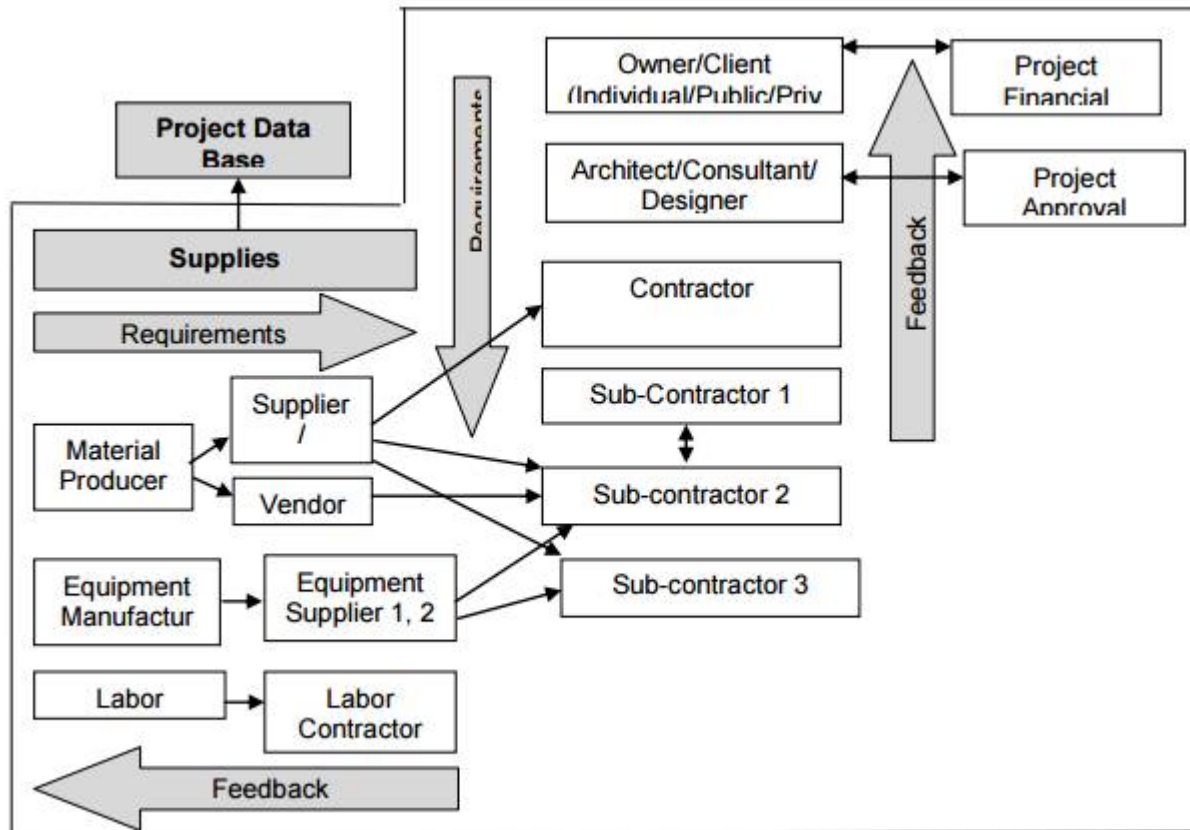


Fig. 1: Typical Construction SCM

Importance of Supply Chain Management

In the ancient Greek fable about the tortoise and the hare, the speedy and overconfident rabbit fell asleep on the job, while the "slow and steady" turtle won the race. That may have been true in Aesop's time, but in today's demanding business environment, "slow and steady" won't get you out of the starting gate, let alone win any races. Managers these days recognize that getting products to customers faster than the competition will improve a company's competitive position. To remain competitive, companies must seek new solutions to important Supply Chain Management issues such as modal analysis, supply chain management, load planning, route planning and distribution network design. Companies must face corporate challenges that impact Supply Chain Management such as reengineering globalization and outsourcing. Why is it so important for companies to get products to their customers quickly? Faster product availability is key to increasing sales, says R. Michael Donovan of Natick, Mass., a management consultant specializing in manufacturing and information systems. "There's a substantial profit advantage for the extra time that you are in the market and your competitor is not," he says. "If you can be there first, you are likely to get more orders and more market share." The ability to deliver a product faster also can make or break a sale. "If two alternative [products] appear to be equal and one is immediately available and the other will be available in a week, which would you choose? Clearly, "Supply Chain Management has an important role to play in moving goods more quickly to their destination.

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Supply Chain Management Today

If we take the view that Supply Chain Management is what Supply Chain Management people do, then in 1997 Supply Chain Management has a firm hand on all aspects of physical distribution and materials management. Seventy-five percent or more of respondents included the following activities as part of their company's Supply Chain Management department functions:

- Inventory management
- Transportation service procurement
- Materials handling
- Inbound transportation
- Transportation operations management

• Warehousing management

Moreover, the Supply Chain Management department is expected to increase its range of responsibilities, most often in line with the thinking that sees the order fulfilment process as one co-ordinated set of activities. Thus the functions most often cited as planning to formally include in the Supply Chain Management department are:

- Customer service performance monitoring
- Order processing/customer service
- Supply Chain Management budget forecasting

On the other hand, there are certain functions which some of us might feel logically belong to Supply Chain Management which companies feel are the proper domain of other departments. Most difficult to bring under the umbrella of Supply Chain Management are:

- Third party invoice payment/audit
- Sales forecasting
- Master production planning

Besides assessing and improving the supply chain, other elements are essential to the methodology of SCM. A generic methodology of SCM can be deduced combining and generalizing the commonalities of different SCM methods. In a way, the SCM methodology bears resemblance to the Deming Cycle (Figure 1.4.1). Generically, the methodology of SCM consists of four main elements: (1) Supply chain assessment, (2) Supply chain redesign, (3) Supply chain control, and (4) Continuous supply chain improvement.

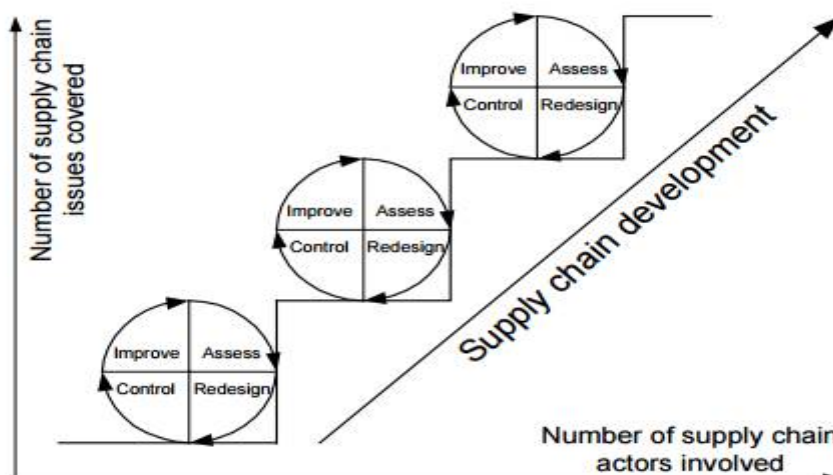


Figure 2: General Approach to Supply Chain Development

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The first step is to assess the current process across the supply chain in order to detect actual waste and problems. The issue here is to find the causality between the waste and problems, and locate their root causes. Once the causality is understood, and having found out about the root causes, the next step is to redesign the supply chain in order to introduce structural resolution of the problems. This includes redistribution of roles, tasks and responsibilities among the actors in the supply chain, and a review of procedures. The next step is to control the supply chain according to its new configuration. An important part of the control is the installation of a monitoring mechanism to continuously assess how the supply chain operates. This includes systems to measure and estimate waste across the supply chain process, and feedback systems to discuss and evaluate underlying problems. The objective is to continuously identify new opportunities, and find new initiatives to develop the supply chain.

IV. CONCLUSION

The key objective of the supply chain management is to offer better underlying value to a client than the competition. This is done through a combination of; defining client value, establishing relationship with suppliers, integrating activities, managing costs collaboratively, developing continuous improvement, mobilizing and developing people. Some areas of application, which may be and to a certain extent have been subjected to SCM, include the reduction of costs (especially logistical costs), lead time and inventory in the supply chain. In view of the large share of these costs in construction, this focus is often fully appropriate. Secondly, the focus may be on the impact of supply chain on site activities. Here the goal is to reduce the site costs and duration. Thirdly, the focus may be on transferring activities from the site to upstream stage of the supply chain to avoid the inferior conditions of site. Therefore, to respond effectively in today's construction challenges and exploit the opportunities, construction supply chain need to adopt a comprehensive and integrated supply chain perspective. Such integrated supply chain will significantly enhance their value and enjoy a distinct competitive advantage.

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