

# Quality in Supply Chain: Case Study of Indian Cement Industry

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**Abstract.** Supply chain management has become essential element for today's business success and it is very important for successfully integrating activities within the firm across the supply chain. It is important to identify the ways to maximize the value within the supply chain. Cement industries are the core manufacturing sector affecting the global growth. The cement industries in India are imbibing the supply chain management concepts and tools to mitigate the competition which is being tougher day by day. Our goal in this paper is to capture the best practices in supply chain management in Indian cement industries. The methodology adopted in this study is the idea drafted followed by reviewing research literatures. Qualitative data collection techniques were used. These data were analyzed using SWOT analysis. The outcomes of the analysis are the peculiar features of the practice of Supply Chain Management in the Indian cement industry.

**Keywords:** Supply chain management, Qualitative technique, SWOT analysis

## 1. Introduction

Supply chain management (SCM) is the management of network of the businesses which are interconnected and involved in the delivery of various products and services to the customers [1]. Supply Chain Management includes movements and storage of raw materials, work-in-process and finished inventory from production to its consumption. The term supply chain management came into widespread use in 1990s. Prior to that time, we were using terms such as logistics and operations management. According to [2], "Supply Chain integrates the key business processes of an organization from end user through original suppliers that provides products, services and information that add value for customers and other Stake holders.

Mohanty and Deshmukh [3] describes, "A supply chain is a network of facilities and distribution options that performs the functions of procurement of materials, transformation of these materials into intermediate and finished products and the distribution of this finished products to customers. Supply chain exists in both service and manufacturing organizations, although the complexity of chain may vary greatly from industry to industry and firm to firm." The supply chain includes all activities associated with the flow and transformation of goods from the raw materials stage, through to the end user. It also includes the associated information flows. Supply chain management is the integration of all these activities through improved supply chain relationships, to achieve a competitive advantage.

The cement industries are playing vital role in the economic and social development of the countries. The Indian cement industry chosen for this study is the biggest cement industries in the country. It is India's foremost manufacturer of cement and concrete. Its operations are spread throughout the country with more than 15 modern cement factories, more than 50+ Ready mix concrete plants, 21 sales offices, 66 area offices and several zonal offices. It has a workforce of about 10,000 persons and a countrywide distribution network of over 10,000 dealers.

## 2. Objectives of the Study

This paper highlights supply chain management practices in an Indian cement industry. We have conducted a study in this cement manufacturing firm and covered its manufacturing units, sales units, marketing offices, warehousing, logistics, procurement, finance, inventory and environment in order to know

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the SCM practices. This study focuses on how an Indian cement industry has implemented supply chain systems; strategy and technology to effectively manage its supply chain operation. The objective of the present work includes the study and analysis the supply chain management Practices in an Indian cement industry. A SWOT Analysis has been conducted to find out strength and weaknesses of the SCM Practices of this company.

### **3. Literature Review**

In recent years the supply chain has evolved as a frequent topic in management, logistics and manufacturing literature. A constantly changing business environment is forcing companies to look for new ways to achieve and sustain competitive advantage. The wider availability of goods and services has led to increasing customer requirements, need for quality and demand. Scenarios are moving in turbulent economic environment, firms are striving for ways to achieve competitive advantage. One of the approaches is to manage the entire supply chain to reduce costs and improve performance to create competitive advantage and business success. Supply chains have become now the focused area for business performance of manufacturing and service organisations. This includes managing supply and demand, sourcing raw materials and parts, manufacturing and assembly, distribution across all channels, and delivery to the customer [4].

According to the Council of Supply Chain Management Professionals (CSCMP), Supply chain management encompasses the planning and management of all activities involved in sourcing, procurement, conversion, and logistics management. It also includes the crucial components of coordination and collaboration with channel partners, which can be suppliers, intermediaries, third-party service providers, and customers. In essence, supply chain management integrates supply and demand management within and across companies.

Many firms nowadays are using their supply chains as competitive weapons and a central element of the strategic management process. It is also important to examine the influence of a culture of competitiveness and knowledge development on supply chain performance in changing and varied market conditions. There should be a sufficient knowledge development on the supply chain in a firm since it can be advantages handling the competition. A culture of competition is prevailing due to affluent available knowledge resources on a particular area of focus. Therefore synergies exist between a culture of competitiveness and knowledge development. For those firms whose managers are unlikely to be able to predict the turbulence in the business they will face over time, a focus on both a culture of competitiveness and knowledge development is critical to ensuring success [5].

The focus of supply chain management (SCM) has shifted from production efficiency to customer-driven and partnership synchronisation approaches. To implement this strategic shift requires high-level collaboration between supply chain partners. A supply chain is a dynamic process and involves the constant flow of information, materials, and funds across multiple functional areas both within and between chain members [6].

In order to ensure the uninterrupted supply of items, it has been observed that more than one supplier or vendor is normally available for each item. Periodic evaluation of supplier quality is carried out to ensure the meeting of relevant quality standards for all incoming items. One also needs to consider many other factors with the aim of developing a long-term supplier relationship. With the increase in use of quality management and Just-in-Time concepts by a wide range of firms, the supplier selection decision has become even more critical [7]. As customers demands are always uncertain, manufacturers tend to manage their suppliers in different ways leading to a supplier–supplier development, supplier evaluation, supplier selection, supplier association, supplier coordination, etc. [8] [9].

There is also an increasing awareness towards the requirement of sustainable development in the area of supply chain management. The companies nowadays are moving ahead and striving for sustainability and Environment. Literatures have recognized the importance of explicitly addressing sustainability issues in supply chain and operations management in recent pasts. However, there is a lack of systematic integration of the environmental and social component of sustainability in addressing supply chain and operations management issues. Efforts to make supply chains more environmentally friendly have gained

top most priority due to increasing threats arising out of phenomena like global warming and climate change [10].

The businesses are being executed now on computers and internet. The E-Procurement is being popularised and it is essentially an Internet/Intranet based purchasing application or hosted services that streamlines buying trading partners, maximizes trade efficiency across the entire supply chain, and provide strategic e-commerce capabilities in real time. E-procurement has become popular due to real time transaction of data information and fund at the same time convenient mode of communication.

On other hand ERP, the enterprise resource planning has gained momentum. Information integration is a key benefit of Enterprise System. Improvements in operational integration enabled by enterprise resource planning can affect the entire organization and therefore can positively impact firm performance and direct benefits to the area of supply chain management systems thereby more sophisticated planning capabilities. Enterprise resource planning systems replace complex and sometimes manual interfaces between different systems with standardized, cross-functional transaction automation. Order cycle times (the time from when an order is placed until the product or service is delivered) can be reduced, resulting in improved throughput, customer response times, and delivery speeds [11] [12]. An enterprise resource planning system exhibits the system to replace complex and manual communications between the systems with standardized, cross-functional operations in order to set the effectiveness in the process and to allow a user friendly platform.

Quality in the supply chain will remain prominent criteria for the evaluation of the supply chain practices. Dubey and Chakrabarty [13] have mentioned in their current research work that innovative practices in supply chain in combination with TQM (Total Quality Management) can help firm to reduce cost and improve customer satisfaction which in turn reflect high profitability and better market share. On other hand the evaluation of supply chain should be based on some relevant criteria. The criteria for evaluation should be carefully selected and these criteria should be both financial and non financial. One important aspect which can be mentioned here is that, evaluation methods that rely only on financial criteria are not well suited for newer generation of supply chain management applications. Hence, the method using both financial and non financial criteria may be the best choice for the evaluation of the supply chain practices. Also, it may be appropriate to use a balanced approach to measure and evaluate supply chains [14].

The supply chain management has gained momentum and has become an essential tool for the success of the business. The industries cannot be imagined without the structured supply chain. The competition has forced companies to explore everywhere and in any area which were earlier considered less significant. One of the similar areas is supply chain management which has become the turning stone for competitors.

#### **4. Methodology**

The methodology adopted for this study is the idea drafted followed by reviewing research literatures. Qualitative data collection techniques were used. Qualitative research is a field of inquiry, which crosscuts disciplines and subject matters. Meanwhile, qualitative aims to obtain an in-depth understanding of human behavior and the reasons that govern human behavior. Qualitative method produces information only on the particular cases and any more general conclusion are only propositions. Qualitative method is further divided in Primary source and Secondary source. After the data collection the data were analyzed by SWOT analysis in context of Strengths, Weakness, Opportunity, and Threat.

Method of data collection is explained in the flow chart given below in the Fig 1. The required data is collected using both primary sources and secondary Sources. Interview technique is used for primary data while secondary data is collected through available published materials in the library and internet. The primary data is collected by means of personal interviews. A set of questions were prepared for the personal interview consisting of questions to meet the objectives of knowing the practices of supply chain management in the industry. The questions were asked and have been thoroughly discussed with the respondent to clarify doubts, if any, regarding what has been asked. It had taken us nearly Four weeks to complete the interviews.



Fig 1. Methods of data collection

The telephonic interviews were conducted for few respondents where it was not possible to approach them personally. Also respondents have been contacted through instant message services to deal with few open ended questions which requires expressing their views in their own words.

#### 4.1. Demography of the Respondents

A wide hierarchy of organizational structure of supply chain management covering almost all the stakeholder departments affecting the SCM operations *viz* procurement, logistics and distribution, project implementation group, central dispatch section, inventory, environment, etc has been contacted and interviewed either personally or telephonically. Then their replies have been received and further clarification and supplementary information considered to be necessary has been secured. The designations of the respondents are Chief Manager, Manager, Dy Manager, Assistant Manager, Sr. Executive, and Executives. The work experience of the respondents is ranging from 02 to 28 years. Overall, 14 respondents were contacted to gather the primary data.

### 5. SWOT Analysis of the Data Collected

SWOT analysis is commonly used to assist in identifying strategic direction for an organization or practice. It encompasses both internal (strength and weaknesses) and external (opportunities and threats) environment. A SWOT analysis generates information that is helpful in matching an organization or a group goal, programmed, and capacities to the social environment in which they operate. It is preferred for the present work as it yields useful information about the viability of the considered system.

The SWOT analysis was used to analysis the data collected in the present study. This SWOT analysis brings out some of peculiar features of the practices of supply chain management in the cement industry. Following are the captured points:

- **Strength**

- Having largest network in India.
- Own railway wagons to transport and its own siding which connects to the railway junction.
- Production of cement has been increasing year by year hence thrust is being given to strengthen its supply chain.
- Technology sharing in the area of supply chain management with its partner company which is a giant cement manufacturing firm in the world.
- This cement industry is operating its distribution and logistics operations through new version enterprise resource and planning tool ERP 6.0. {Sales and Distribution module (SD) Module}.
- It is one among the few manufacturing firms working with all the modules of SAP thereby managing the chain real-time with inter functional collaboration.
- Its operations like manufacturing, environment, health and safety is certified by leading agencies e.g. ISO-9001, ISO-14001 and ISO-18001.
- It is using managing its supply chain using RFID for its bulk loading operations and concrete divisions.
- Dedicated and experienced team of sales, distribution and logistics.

- **Weaknesses**

- However there is a central procurement organization for the cement industry under study there are issues procurement function particularly in supplier selection and segmentation hence lacking smooth operations of procurement functions.
- Lacking a system in place for eco-friendly distribution (dispatches) and logistics particularly reverse logistics management.
- Quality is an area of concern in cement supply chain. The quality aspect can be better adhered using innovative practices.
- The operating expenses of the company are comparatively high which may affect its profit earning capacity thereby directly affecting the SCM.
- Employees are reluctant towards adoption of latest innovations and technology due to a traditional work culture.
- Little Information sharing in the area of Supply Chain.
- Very few training programs for improving its supply chain functions and employee development.

- **Opportunities**

- The company has opportunity to expand its market share by introducing new products with reasonable price for which SCM can play vital role.
- It has opportunity to increase its production & distribution by improving its distribution management as it came out as one of the improvement area during interviews.
- People are opting for more stable structures and intensive use of cement is taking place, even government is spending heavily on infrastructure projects. Thus, this is the right time to fully tap these markets. Supply chain management strategies may be advantageous in grabbing this opportunity.
- Foreign direct investment in infrastructure sector going to increase in coming years, which will increase the demand of cement.
- Since market is expanding improved procurement strategies may be sought and there is an opportunity to manage its supply chain green and clean.

- **Threats**

- Large number of players in cement industry makes it more competitive for the cement industry to carefully price its product and at the same time satisfy its dealers and customers.
- Lacking know how of latest supply chain management may pull company back in competition.
- Other emerging players in the Indian cement markets are the threats to company and they are eating up considerable market share.
- Due to India's exponential growth many new international cement companies are expected in coming years which will bring a tide of change in the area of concern i.e. supply and distribution management.
- The emergence of small players in this market may increase the competition and start the malpractices, and heavy discounts to retailers.

## **6. Conclusions**

The objective of this study is to investigate supply chain management practices in an Indian cement manufacturing firm. The key learning of the study suggest that there is a bunch of supply chain management good practices exists in the Indian cement industry. A number of innovative projects and schemes are being run to manage supply chain operations in the cement industry in an effective and productive manner. There are certain issues one of them is with supplier selection, supplier relation and supplier qualification. Supply chain environmental issues, quality issues, are the key area of concern. The Indian cement industry is seeking implementation of green supply chain measures to effectively address these issues.

The major limitation of the study was that most of the respondents being very loyal to the company and were reluctant to give response. The numbers of respondents need to be increased. Qualitative methods have been used which produces generalized results. This work may be carried out for other cement manufacturing organization.

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