

Implementation Barriers for Sustainable Supply Chain Management in India

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Abstract: Supply Chain Management (SCM) has been receiving significant attention of practitioners and researchers for many years. Main areas are integration of activities; cooperation and coordination; vendor selection and development; logistics management; utilization of resource in optimum manner; and so on to gain economic benefits. Due to growing concern about environmental and social consequences, a need has been felt globally to manage supply chains in a sustainable manner. This study focuses segmenting critical factors for successful implementation of Sustainable Supply Chain Management (SSCM). Review of literature has helped us to identify ten critical factors for successful implementation of SSCM. This paper may surely help researchers and practitioners in better understanding and prioritization of these critical factors towards effective and successful implementation of SSCM.

1. Introduction

Supply Chain Management (SCM) is the systemic, strategic coordination of functions that seeks to improve long-term performance. A supply chain consists of all parties involved, directly or indirectly in fulfilling a customer request. The supply chain not only includes the manufacturer and the supplier but also transporters, warehouses, retailers, and customers themselves. Within each organization the supply chain includes all the functions involved in receiving and filling a customer request.

Supply chain management (SCM) is "the systemic, strategic coordination of the traditional business functions and the tactics across these business functions within a particular company and across businesses within the supply chain, for the purposes of improving the long-term performance of the individual companies and the supply chain as a whole. It has also been defined as the "design, planning, execution, control, and monitoring of supply chain activities with the objective of creating net value, building a competitive infrastructure, leveraging worldwide logistics, synchronizing supply with demand and measuring performance globally. The objective of every supply chain is to maximize the overall value generated. The value a supply chain generates is the difference between what the final product is worth to the customer and the cost of supply chain incurs in filling the customer's request. For most commercial supply chains, value will be strongly correlated with supply chain profitability i.e. the difference between the revenue generated from the customer and the overall cost across the supply chain. Supply Chain Management is the systemic approach to managing the flow of information, material and services from raw material suppliers to the end customer. Within the diamond supply chain, management must be focused on optimizing global suppliers and production and distribution network.

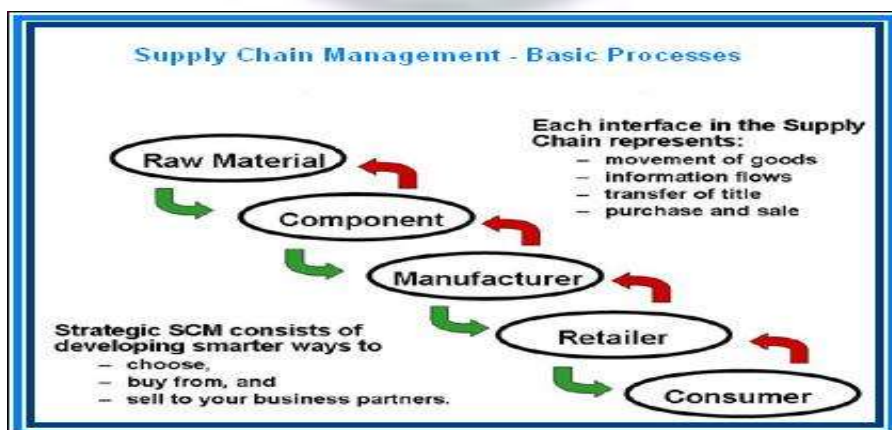


Figure: SCM Basic Process

2. Functions

SCM is a cross-functional approach that includes managing the movement of raw materials into an organization, certain aspects of the internal processing of materials into finished goods, and the movement of finished goods out of the organization and toward the end consumer. As organizations strive to focus on core competencies and becoming more flexible, they reduce their ownership of raw materials sources and distribution channels. These functions are increasingly being outsourced to other firms that can perform the activities better or more cost effectively. The effect is to increase the number of organizations involved in satisfying customer demand, while reducing managerial control of daily logistics operations. Less control and more supply chain partners led to the creation of the concept of supply chain management. The purpose of supply chain management is to improve trust and collaboration among supply chain partners, thus improving inventory visibility and the velocity of inventory movement.

Main functions of Supply Chain Management are as follows:

- Inventory Management
- Distribution Management
- Channel Management
- Payment Management
- Financial Management
- Supplier Management
- Transportation Management
- Customer Service Management

3. Supply Chain process: Cycle View and Push/Pull view

3.1 Cycle View

The processes in a supply chain are divided into a series of cycle, each performed at the interface between two successive stages of a supply chain. Cycle view of Supply chain process includes: Customer order cycle - Replenishment cycle - Manufacturing cycle - Procurement cycle.

3.2 Push/ Pull view

The processes in a supply chain are divided into two categories depending on whether they are executed in response to a customer order or in anticipation of customer orders. Pull process are initiated by a customer order, whereas push process are initiated and performed in anticipation of customer orders. Companies are enhancing their competitiveness with improvement initiatives, such as implementation of Just-in-Time (JIT) and Quick Responses (QR) inventory management policies, business reengineering, and supply chain management. Supply chain management involves developing efficient and effective information systems that can inform strategic decisions. The supply chain information systems rely on either EDI (Electronic Data Interchange) or the Internet to transmit information within the supply chain. Information systems are essential to managing a supply chain.



Figure: Components of SCM

4. Sustainability in Supply Chain

Supply chain sustainability is based on the principle that socially responsible products and practices are not only good for the environment, but are important for long-term profitability. Supply chain sustainability is a holistic perspective of supply chain processes and technologies that go beyond the focus of delivery, inventory and traditional views of cost. This emerging philosophy is based on the principle that socially responsible products and practices are not only good for the environment, but are important for long-term profitability. In practice, supply chain sustainability can include projects to reduce energy cost, any form of waste and application of green technologies within transportation and logistics networks. A larger shift involves a deeper level of collaboration with internal and external supply chain partners to reexamine delivery methods, products, packaging and measurement systems.

4.1 Three Tiers of Sustainability

Tier 1: Getting the basics right

This is the base level and is the stage in which the majority of organizations are at. Companies employ simple measures such as switching lights and PCs off when left idle, recycling paper, and using greener forms of travel with the purpose of reducing the day-to-day carbon footprint. Some companies also employ self-service technologies such as centralized procurement and teleconferencing.

Tier 2: Learning to think sustainably

This is the second level, where companies begin to realize the need to embed sustainability into supply chain operations. Companies tend to achieve this level when they assess their impact across a local range of operations. In terms of the supply chain, this could involve supplier management, product design, manufacturing rationalization, and distribution optimization.

Tier 3: The science of sustainability

The third tier of supply chain sustainability uses auditing and benchmarks to provide a framework for governing sustainable supply chain operations. This gives clarity around the environmental impact of adjustments to supply chain agility, flexibility, and cost in the supply chain network. Moving towards this level means being driven by the current climate (in

which companies recognize cost savings through green operations as being significant) as well as pushing emerging regulations and standards at both an industry and governmental level.

4.2 Application of Sustainability

Companies looking to implement sustainable strategies down its supply chain should also look upstream. To elaborate, if a company is able to choose between various suppliers, it can for example use its purchasing power to get its suppliers in compliance with its green supply chain standards. In managing suppliers, companies must measure that inputs from suppliers are of high quality, and the usage of water and energy is minimized leading to less pollution, defects and over production. They also must audit their supplier base and make sure that they are improving the supply chain metrics.

4.3 Challenges in Measuring Supply Chain Social Sustainability

As Sustainable Brands readers know, there is growing interest in achieving sustainable production systems. This has been attributed to many factors, including: increasing costs of energy and resources, risks associated with material availability and use, consumer demands, government regulations, and altruistic interest in reducing the negative environmental and social impacts of production. However, challenges to establishing sustainable production systems exist. As noted in a National Institute of Standards and Technology (NIST) industry workshop report: "Industry is unable to measure economic, social, and environmental consequences of their activities and products accurately during the entire life cycle and across their supplier network"

While there are challenges in measuring attributes of the three pillars of sustainability (i.e., economic, environmental, and social), tracking the financial implications of different scenarios is an implicit part of doing business. There has been increase in attention on the environmental pillar of sustainability over the past several decades. As a result, tools, concepts, and principles such as life-cycle assessment, carbon footprint estimation, design for the environment, and product stewardship are becoming commonplace. Decision-makers in industry (from the board room to the drawing board) now often consider such measures of performance as greenhouse gas emissions (GHG), resource consumption, solid waste discharges, liquid effluent wastes and toxic emissions. Without performance measures such as these, it is difficult to judge how a change to a product or production system affects environmental sustainability. These metrics and associated decision-making tools are critical to enabling an organization to measure its progress toward sustainability and communicate its progress to others.

The social dimension of sustainability is also important to many organizations; however, there are many challenges to measuring the social sustainability of production systems. Four interrelated challenges are: establishing metrics, prioritizing issues, identifying and tracking issues in the supply chain, and developing strategies to address social impacts. Essentially, the questions are:

- What metrics of social performance have been established?
- What metrics should be used within an organization?
- How can these metrics be used in an organization and throughout its supply chain?
- Once issues are identified, what can be done to improve?

Two common issues are associated with elements of a company's supply chain, for example material handling problems and associated impacts or labor practice. Nike's problems with labor, including alleged child labor practices, were raised some years ago are still not completely resolved; years later, in this 2008 article Nike stated that improving the working conditions for workers in its supply chain "continues to be one of our greatest priorities."

Ford, for example, has a supply chain sustainability group that is charged with maintaining long-term relationships and trying to understand and "align" with their suppliers on a wide range of sustainability related issues such as "greenhouse gas emissions management and human rights." This organization is also working to build into the company's purchasing functions the ability to identify and deal with sustainability issues as part of their routine business processes. Further, the auto industry, as have many industries, has also had to address the issue of conflict minerals entering the supply chain. Numerous minerals on the conflict list are present in automotive components and they enter the vehicle through often complex supply chain interactions. But these three examples, representing clear social impacts in terms of labor and human

rights, are in fact relatively "simple" examples. The real issue of achieving sustainable production systems, and not just specific (albeit important) elements, is still a daunting challenge.

Supply chains are critical links that connect an organization's inputs to its outputs. Traditional challenges have included lowering costs, ensuring just-in-time delivery, and shrinking transportation times to allow better reaction to business challenges. However, the increasing environmental costs of these networks and growing consumer pressure for eco-friendly products has led many organizations to look at supply chain sustainability as a new measure of profitable logistics management. This shift is reflected by an understanding that sustainable supply chains frequently mean profitable supply chains. Many companies are limited to measuring the sustainability of their own business operations and are unable to extend this evaluation to their suppliers and customers. This makes determining their true environmental costs highly challenging and reduces their ability to remove waste from the supply chains. However much progress has been made in defining supply chain sustainability and benchmarking tools are now available that enable sustainability action plans to be developed and implemented.

One of the key requirements of successful sustainable supply chains is collaboration. The practice of collaboration — such as sharing distribution to reduce waste by ensuring that half-empty vehicles do not get sent out and that deliveries to the same address are on the same truck — is not widespread because many companies fear a loss of commercial control by working with others. Investment in alternative modes of transportation — such as use of canals and airships — can play an important role in helping companies reduce the cost and environmental impact of their deliveries.

5. Literature Review

We have explored various available literatures: national and international journals and proceedings of national and international conferences; and research organizations. Important Ten barriers to implement SSCM have been identified from extensive literature review and explained as follows:

1 Lack of legislative framework

Legislation and regulation are the instruments very much necessary for the proper governance of business enterprises including the environment in which they operate. Environmental laws and regulations are an important framework, within which the companies must operate (Mathiyazhagan et al., 2013). Legislative framework may be an important for creating a favorable environment for businesses to adopt SCCM by providing policy frameworks and can ultimately create demand for sustainable products (Gouldson and Murphy, 2013). Many researchers reported that there is lack of legislative frameworks and policies, which supports green/sustainable efforts in supply chain (Mathiyazhagan et al., 2013; Muduli et al., 2013a; Govindan et al., 2014).

2 Political instability

Regulations and policies vary depending on the people, culture, and the politics of that country. Regulatory authorities fail to extend proper support to maintain a green environment due to political instability (Govindan et al., 2014). Political instability, corruption and lack of civil society are major barriers to implement green/sustainable regulations and policies (Kumar et al., 2014; Luthra et al., 2015).

3 Unawareness among society about social practices

NGOs and environmental advocacy groups force companies to seriously think about their environmental management programs (Walker et al., 2008). There is a lack of strong environmental conservation or citizen groups in India (Muduli et al., 2013a). Low demand from customers for eco-friendly products due to lack of awareness among society (Mudgal et al., 2010; Govindan et al., 2014).

4 Lack of customer support

A major barrier of GSCM seen in Indian automobile industry is lack of awareness of customers about the benefits of green products. Customer demands become most crucial type of external pressure (Luthra et al., 2011). Lack of customer support has been found as one of major hurdles in implementing SSCM practices (Winter and Knemeyer, 2013; Zhu and Geng, 2013).

5 Top management commitment inadequacy

Resistance of the top management of an organization to bring a change to the existing investments, information systems and habits and hence a change to a new supply chain system (Mathiyazhagan et al., 2013; Govindan et al., 2014).

Organization often lack the internal mechanisms to properly value the benefits of managing environmental sustainability, such as reduced exposure to energy price volatility, water risks and other environmental impacts of operations and supply chains (<http://www.wri.org>).

6 Financial checks

Lack of funds for environmental projects or the consideration that Return on Investment (ROI) period after implementing green/sustainable supply chain management is very long (Luthra et al., 2011; Luthra et al., 2013; Govindan et al., 2014). Many firms struggle to engage in SSCM due to high costs and a lack of financial resources. SSCM practices such as conducting audits or running supplier development programs are costly and time consuming (Grimm et al., 2014).

7 Lack of knowledge among SC members

Lack of knowledge about actual benefits and motivation can lead to not giving due attention to sustainable corporate, social and environmental efforts for enhancing organizational sustainability over the long- term. Lack of knowledge of SC members' sustainability encourages firms to retain the status quo; such inaction is an important barrier to engaging the SSCM, not to mention increasing the level of sustainability (Vijfvinkel et al., 2012; Al Zaabi et al., 2013).

8 Lack of trust among SC members

The issue of trust among SC members plays a significant role, since lack of trust is a barrier for collaboration (Walker et al., 2008; Beske and Seuring, 2014). Trust among SC members to implement SSCM will provide benefits to SC members that include customer satisfaction, quality, and innovation, trust, managing supply risk, fill rate, optimal inventory, flexibility, lead time and cost control (Ageron et al., 2012).

9 Technical obstructions

Technical obstructions (such as lack of new technologies, materials and lack of technical expertise) have been reported as a key barrier in Indian industries especially in auto component manufacturing firms (Mathiyazhagan et al., 2013). Technical complexity and non-availability of appropriate technology/process within organizations have found major hurdles to adopt green/sustainable supply chain (Luthra et al., 2011; Govindan et al., 2014).

10 Organizational culture resistance to change

Organizations fail to adopt environmental initiatives due to internal factors including sunk costs, improper communication structures, internal politics, and institutional norms (Carter and Rogers, 2008) People avoid change whenever possible, and the GSCM/SSCM requires a radical change in the mindset and practice (Mudgal et al., 2010; Luthra et al., 2011). Resistance can be attributed to human nature because any change in previous methodologies or in working styles demands a new way of thinking (Muduli et al., 2013b).

Conclusion

In present paper, barriers to implement SSCM in Indian industries have been identified. Ten barriers to implement SSCM in Indian industries have been identified from the exhaustive literature review. This study focuses on investigation of influential strength of these factors on sustainable supply chain management of Indian industries.

This research work will help the managers in achieving the objectives, as follows:

- To identify various factors affecting SSCM
- To investigate the influential strength of identified factors;
- To develop a hierarchical framework in India; and
- To confer the research managerial implications.

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