# GREEN SUPPLY CHAIN MANAGEMENT IN INDIAN ELECTRONICS & TELECOMMUNICATION INDUSTRY

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## Abstract:

The study investigates the Green Supply Chain Management practices adopted by the Electronics & Telecommunication Industry in India. Study focuses on the impact of environmental collaboration in the supply chain on manufacturing and environmental performance. This paper used inductive and qualitative approaches to explore the salient factors that simultaneously enhance the "greening the supply chain" as well as maximizing the customer reach while maintaining the efficiency of the supply chain system of Electronics & Telecommunication Industry. A survey was conducted with key informants across many divisions of the Electronics & Telecommunication Industry to investigate how well these environmental and customer reach in the supply chain are in synchronized with the top management's commitment towards environmental responsiveness and maximizing customer orientation. The responses to the survey were statistically analyzed and a relationship model was constructed with Market orientation as the dependent variable and independent variables as: environmental policies, supplier policies, commitment to human capital and diversity, sustainability and market orientation. The paper proposes to measure the performance of the corporation with respect to greening the supply chain, maximizing the reach of consumers and operational efficiency with a view of re-engineering the existing supply chain. The key indicators identified were environmental policies, supplier policies, sustainability, market orientation and commitment to human capital and diversity. The questionnaires have been developed by submitting the statements to respondents and discussing with experts, who were believed to have knowledge of the subject for fair judgment. The target respondents of our survey were requested to indicate, using a five-point

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Likert scale, the extent to which they perceived their companies implementing each of the dimensions of Green Supply Chain Management practices. The data was analyzed using mean score. These dimensions are represented in the form of questionnaire, for measuring the different facets of Green Supply Chain Management practices implementation, enabling industries to evaluate their strength and weakness in the course of implementing these practices. The approach used in the study includes an in depth interviews and questionnaire surveys. The electronics and telecommunication products industry in India were sampled for empirical study. Results indicate that performance of eco procurement, eco logistics design, eco product design & eco manufacturing practices in response to the current wave of green issues and also environmental performances of the electronics and telecommunication industry.

**Keywords:** Business processes, Capacity, DRP, JIT, MRP, Organizational Structure, Product, Price, Quality, Supply Chain Management, VMI

## 1. Introduction

Green supply chain management leverages the role of the environment in value creation. It facilitates offering maximum value to all stakeholders like employee satisfaction, environmental sustainability, better quality of life to community and consumers together apart from ensuring tangible and intangible benefits to the firm. India has gained its position among the top ten countries and has become one of the largest manufacturing economies of the world. Chetan Kumar M. Sedani, Ramesh R. Lakhe (2011) et al. [1]. The pressure and drive accompanying globalization has prompted industries to improve their environmental performance. Zhu and Sarkis (2006) et al. [8]. The supply chain is an integrated manufacturing process wherein raw materials are converted into final and finished products, then delivered to consumers or end user. An increasing number of supply chains invest in recycling systems intended to retrieve waste or used product from consumers. Green supply chain management combines green procurement, green manufacturing/materials management, eco accounting, green distribution/marketing and reverse logistics. There are two basic processes in the supply chain: (1) production planning and inventory control, and (2) distribution and logistics. Seok Jin Lim, Suk Jae Jeong, Kyung Sup Kim, Myon Woong Park (2006) et al. [7]. Minimizing the generation of hazardous waste, recovery of valuable materials from the waste and preventing the environmental deterioration are

some complex issues which require prime attention G. Kannan (2010) et al. [2]. Efficient Green Supply Chain is shown in Figure 1. The main areas of focus within the green supply chain are:

- **Material selection**
- Sourcing policies
- Resource consumption
- Green product packaging
- Green product design
- Optimum Transportation Network
- Supply network compliance

Green Supply Chain Value

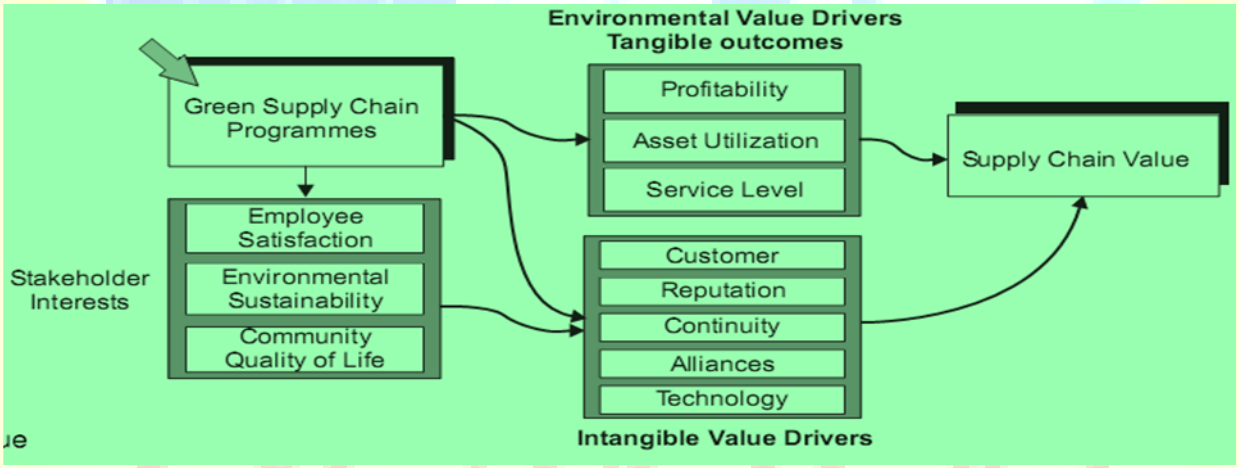


Figure 1 Efficient Green Supply Chain

## 2. Literature Review

Shang (2010) et al. [4] conducted a study based on six dimension of green supply chain management i.e. eco design, green manufacturing and packaging, environmental participation, green marketing, stock and suppliers. The results inferred that the firms which were focusing on green marketing had been successful competitors against the rivals. A decision model to measure environmental practice of suppliers using a multi attribute utility theory approach developed by

Handfield (2002) et al. [3]. Quinghu Zhu (2008) et al. [5] Conceptualize Green Supply Chain Management practices implementation as encompassing different dimensions of practices including Green Procurement, Internal Environmental Management, Eco Design, Customer Cooperation, and Investment Recovery. Ramudhin (2010) et al. [6] proposed a strategic planning model and insisted that internal and external control mechanism are of great importance to decision makers while designing sustainable supply chain network.

**3. Research Methodology**

The questionnaires have been developed by submitting the statements to respondents and discussing with experts, who were believed to have knowledge of the subject for fair judgment. The target respondents of our survey were requested to indicate, using a five-point Likert scale (1- Below average/Completely disagree, 2-Average/ Rarely agree, 3-Good/ Partly agree, 4 –Very good/ Rather agree, 5- Excellent/Completely agree), the extent to which they perceived their companies implementing each of the dimensions of Green Supply Chain Management practices. Item analysis was conducted through a mean score. These dimensions are represented in the form of questionnaire, for measuring the different facets of Green Supply Chain Management practices implementation, enabling industries to evaluate their strength and weakness in the course of implementing these practices.

**4. Management of Supply Chain**

Success is increasingly being dictated by how well a company can control its supply base and mitigate supply bottlenecks and liabilities. Reengineering (or re-engineering) is the radical redesign of an organization's processes, especially its business processes. Rather than organizing a firm into functional specialties (like production, accounting, marketing, etc.) and looking at the tasks that each function performs, we should, according to the reengineering theory, be looking at complete processes from materials acquisition, to production, to marketing and distribution. The firm should be reengineered into a series of processes.

The Business processes pictured as a set of triangles as shown below in Figure 2. The model will be used to define the supplier and process inputs, your process, and the customer and associated outputs. The feedback loop from customers will also be used as shown

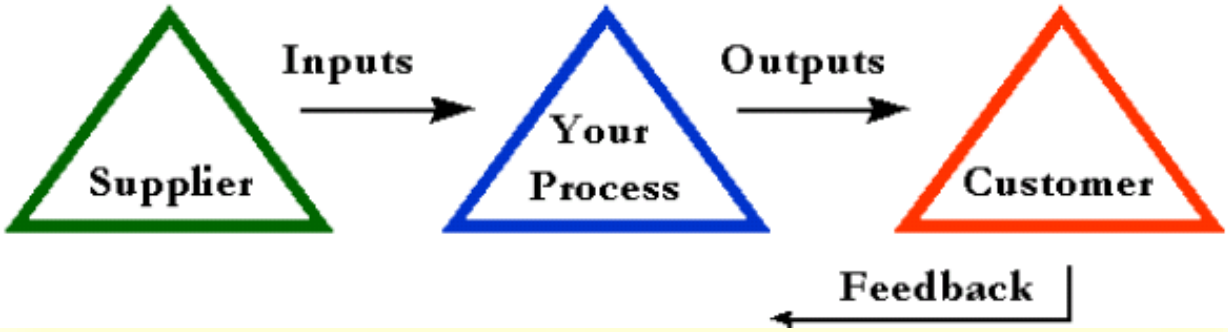


Figure 2: The Business processes pictured as a set of triangles

Improving business processes is paramount for businesses to stay competitive in today's marketplace. Over the last 10 to 15 years companies have been forced to improve their business processes because we, as customers, are demanding better and better products and services And if we do not receive what we want from one supplier, we have many others to choose from (hence the competitive issue for businesses). Many companies began business process improvement with a continuous improvement model. The paper will attempt to understand and measure the current process, and make performance improvements accordingly. Figure 3 given below illustrates the continuous process improvement basic steps.


Figure 3. Continuous process improvement

The research will begin by documenting what Companies do today, establish some way to measure the process based on what their customers want, do the process, measure the results, and then identify improvement opportunities based on the data collected. Then implement process improvements, and measure the performance of the new process. This loop repeats over and over again, and is called continuous process improvement and the proposed research will be following

this line of action. Based on a literature review, the following are the critical factors in managing the supply chain of company:

**4.1. Greening the Supply Chain**

How the companies can take a proactive posture in requiring a significant level of environmental responsibility in core business practices of their suppliers and vendors. Greening the "Supply Chain" refers to firms integrating environmental issues which include pre-development activities, supplier's business practices, product design and development Environmental responsive companies take proactive posture in requiring a significant level of environmental responsibility in core business practices of their suppliers and vendors. Companies are increasingly giving attention not only to the environmental characteristics of their products, but also to the developmental process, paying particular attention to the supply chain activities.

**4.2 Maximize the reach of consumers**

It is critical to work with supply chain partners to prospect and generate quality customers. Accelerating sales cycles by innovating internet based selling and hence allowing customers to access us 24/7 via web touch settings. It is imperative to educate customers by enabling them to complete routine self-service tasks by themselves. It also helps to build loyalty by relying on a variety of programs in giving our customers an outstanding use experience. A sustainable business value can be created by offering a tiered approach with distinct marketing, sales, training, and support services for each customer segments

**4.3 Enhancing Supplier Diversity**

Expanding the supplier base enables firms to include more diverse suppliers hence encouraging competition, enhancing transparency, and lowering costs for all parties concerned. Increase participation of local and national divisions in seeking out diverse and under-represented categories when seeking out new sources for suppliers and services. It is critical to implement enhanced quality training, educational, employment and networking services for the under-represented suppliers, and a successfully implementation of a web based Business-to-Business exchange system, mutually and simultaneously beneficial to many stakeholders.

### 4.4 Maximizing Operational Efficiency

How we can maintain cost competitiveness through the restructuring of the supply chain systems. Companies are serious about maintaining cost competitiveness or customer service differentiation must re-examine their process, measurement, and technology approaches and seek new areas of supplier performance improvement including:

- Inserting control points at suppliers to minimize errors.
- Resolving last-minute supply disruptions based on cross-functional business goals.
- Using predictive analytics to transform static supplier scorecards into forward-looking risk management instruments

Organizations have multiple objectives like enhanced competitiveness, better customer service and increased profitability etc. To seek these objectives organizations employ various defensive as well as offensive business performance improvement approaches. Approach we have discussed (SCM) covers all functional areas of organization. It is the network of customers, suppliers, manufacturers, and distributors concentrating the flows of material, information, and finance through physical and human resources. This step-by-step assessment of business operations would certainly assist organizations to completely understand the concept of supply chain management.

### 4.5 Organization

Rapid innovations in the field of information and communication technologies, and their extensive application in the achievement of supply chain objectives and coordination, organizational structure now goes beyond the structure in the form of virtual evolutionary trends in supply chain organization as shown in Figure 4

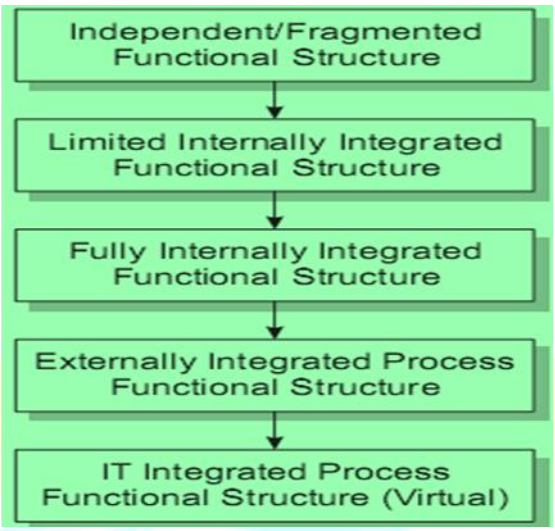


Figure 4: Evolutionary Trends in Supply Chain Organization

Independent Functional Structure is shown in Figure 5

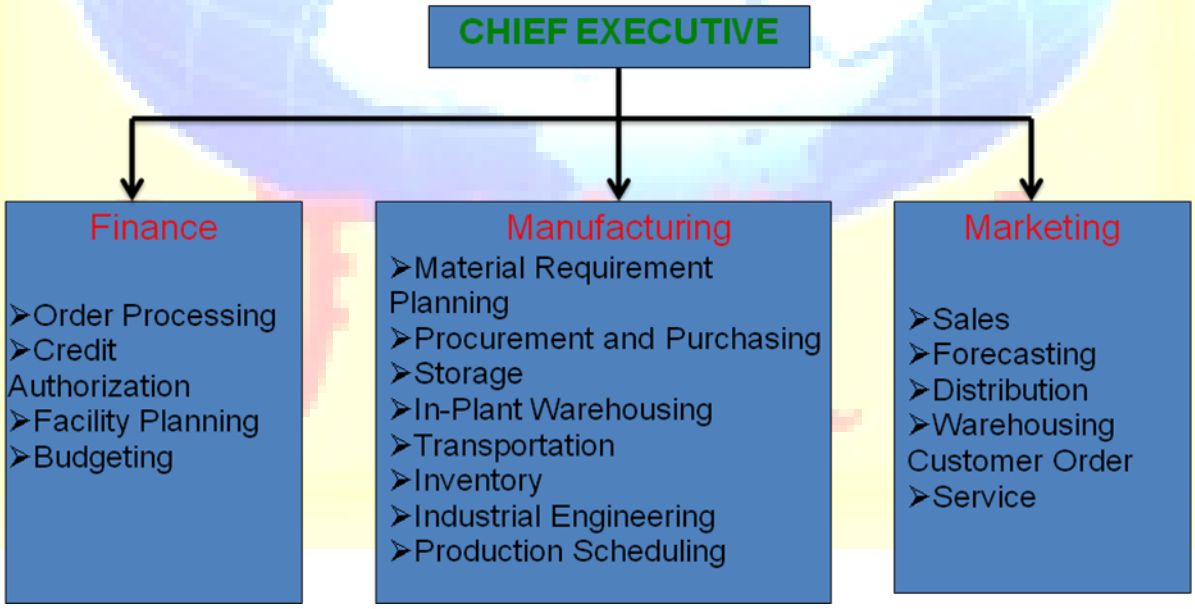


Figure 5: Independent Functional Structure in Supply Chain Organization

Limited Internally-Integrated Functional Structure is depicted in Figure 6

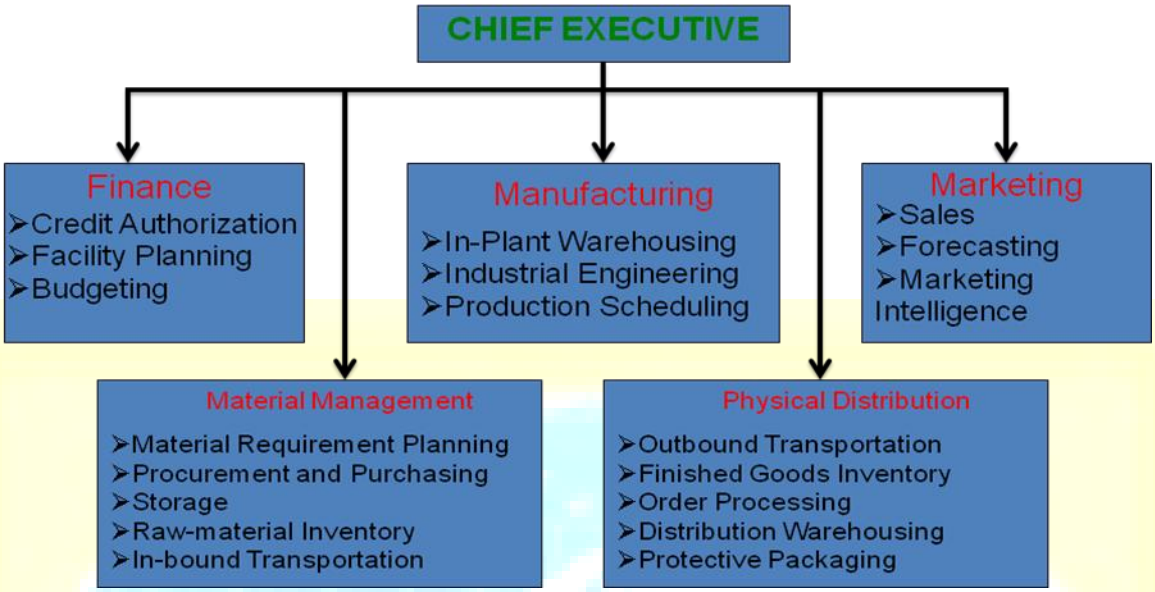


Figure 6: Limited Internally-Integrated Functional Structure

Fully Internally-Integrated Functional Structure illustrated in Figure 7 below.

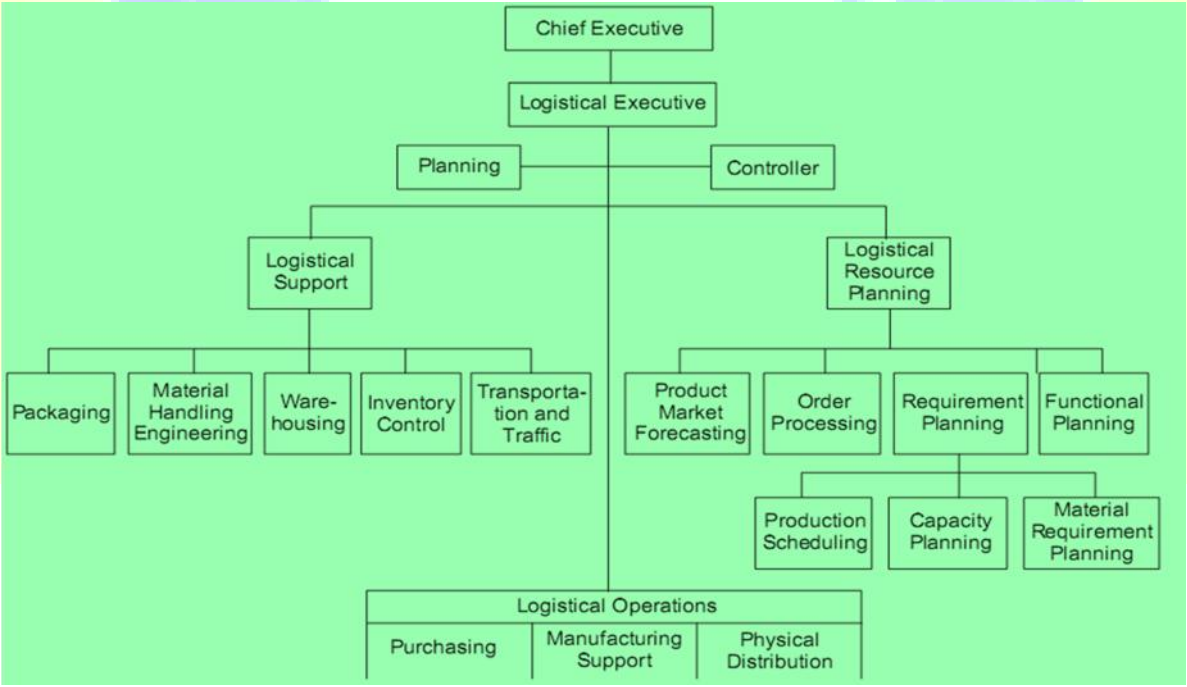


Figure 7: Fully Internally-Integrated Functional Structure

### 4.5.1 Externally-Integrated Process Functional Structure

The total business functions revolutionized mainly due to rapid innovations in the field of science and technology, especially information and communication technologies; birth of new management techniques for inventory management like, JIT, MRP, DRP, etc., and mass scale globalization of market. Virtual supply chain is the extension of the information system beyond the conventional dimensions of pyramidal organizational structure of planning and control. It links the customers directly to the supplier and even supplier's suppliers, so that the supplier can respond on a real-time basis to the changes in the market and a vendor-managed inventory (VMI) system can be developed.

**Organizational Principles**

- Unity of Command
- Span of Control
- Authority and Responsibility
- Line and Staff Relationships
- Centralization vs. Decentralization

**Factors influencing Organizational Structure**

- Organizational Size
- Corporate Structure
- Corporate Strategy
- The Role of Supply Chain
- Information Technology Resource
- Environmental Uncertainty

## 5. Conclusion

This paper used inductive and qualitative approaches to explore the salient factors that simultaneously enhance the "greening the supply chain" as well as maximizing the customer reach while maintaining the efficiency of the supply chain system of Electronics & Telecommunication Industry. The key indicators identified were environmental policies, supplier

policies, sustainability, market orientation and commitment to human capital and diversity. The responses to the survey were statistically analyzed and a relationship model was constructed with Market orientation as the dependent variable and independent variables as: environmental policies, supplier policies, commitment to human capital and diversity, sustainability and market orientation. The approach used in the study includes an in depth interviews and questionnaire surveys. The electronics and telecommunication products industry in India were sampled for empirical study. The questionnaires have been developed by submitting the statements to respondents and discussing with experts, who were believed to have knowledge of the subject for fair judgment. The target respondents of our survey were requested to indicate, using a five-point Likert scale, the extent to which they perceived their companies implementing each of the dimensions of Green Supply Chain Management practices. The data was analyzed using mean score. These dimensions are represented in the form of questionnaire, for measuring the different facets of Green Supply Chain Management practices implementation, enabling industries to evaluate their strength and weakness in the course of implementing these practices. Results indicate that performance of eco procurement, eco logistics design, eco product design & eco manufacturing practices in response to the current wave of green issues and also environmental performances of the electronics and telecommunication industry. The paper helps supervisors & decision makers to improve their understanding of Green Supply Chain Management practices.

## 6. References

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