



## Globalizing the Thoughts of Indian Supply Chain Management

### KEYWORDS

Supply Chain Management (SCM), cost reduction, issues and challenges in Supply Chain Management in India.

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**ABSTRACT** Supply Chain Management (SCM) assists any business organization to compete in the dynamic international market. The objective of SCM is to incorporate activities across and within organizations to provide value addition to customers. Supply chain has a big role to play and companies expect their supply chains to be a source of competitive advantage. Due to Globalisation and downward price pressure, supply chain mapping helps to identify "choke points" to enable smooth flow of goods, people and services, while ensuring that the Indian products are globally competitive by reducing the logistics cost, in-turn leading to reduced carbon foot print. These cost savings will also enable strategic investments in information technology because information technology tools and techniques play a very important role in the performance of SCM.

This paper defines SCM and its evolution and analyses the trends of SCM & its future in India. The paper highlights the current issues and challenges of Supply Chain Management in India and will discuss on optimizing the delivery of goods, services and information from supplier to customer, thus ensuring an effective supply chain that makes companies more competitive, profitable and sustainable. The major challenge will be to build a supply chain with a vision of long-term growth, which is flexible and responsive to handle short-term demand variations in resonance with conceptualising Indian thoughts globally.

### Introduction:

Supply chain has evolved from the era related to materials flow (Forrester, 1961). It is viewed as a single process. Supply chain is needed for various reasons such as improving operations, increasing profits, enhancing customer satisfaction, competitive pressures, increasing globalization and growing complexity. SCM calls for strategic decision-making since it is a shared objective of every function in the chain and also due to its impact on overall costs, profits and market share. Some of the Supply chain strategies would be as two or more firms in the chain entering into a long-term agreement; developing trust and commitment to each other and also integrating logistics which involves sharing of demand and supply data.

Supply chain consists of different functions such as purchasing, sourcing, production, planning, stores, warehouses, logistics, distributors and dealers. Supply chains are relatively easy to define for manufacturing industries, where each participant in the chain receives inputs from a set of suppliers, processes those inputs, and delivers them to a different set of customers. The major challenge is to build a supply chain with a vision of long-term growth and which is flexible and responsive to handle short term demand variations. Intense competition and global value chains are leading to shifts which are expected in supply chain function.

Indian companies are moving towards making their supply chain and logistics efficient. India's unique operational challenges make such expectations extremely challenging. However there are examples from the Indian industries who have managed to move beyond the constraints and to develop supply chain that lead to competitive advantage.

### Literature Review:

American Production and Inventory Control Society (APICS, 1990) defines supply chain, as the processes from the initial raw materials to final consumption of the finished products linking across supplier-user industries. Council of SCM Professionals (CSCMP) has defined SCM as "SCM encompasses the planning and management of all activities involved in sourcing and procurement, conversion, and all Logistics Management activities. SCM integrates supply and demand management within and across companies" (Ballou, 2007). Scott and Westbrook (1991) described SCM as the chain linking each element of the manufacturing and supply process from raw materials to the end user.

Supply chain is defined as all the activities involved in delivering a product from raw materials to the customer including sourcing raw materials and parts, manufacturing and assembly, warehousing and inventory tracking, order entry and order management, distribution across all channels, delivery to the customer, and the information systems necessary to monitor all of these activities. SCM coordinates and integrates all of these activities into a seamless process. SCM is defined as the systemic, strategic coordination of the traditional business functions and the tactics across these business functions within a particular organization and across businesses within the supply chain, for improving the long-term performance of the individual organization and the supply chain as a whole (Mentzer and et al., 2001). SCM comprises integrated functions from raw materials to final products. It also covers integrated management of every organization throughout the whole chain (Horvath, 2001; Talluri, 2002). The Council of Logistics Management (CLM) (2000) defines SCM as "the systematic, strategic coordination of the traditional business functions and tactics across these business functions within a particular organization and across business within a supply

chain for the purpose of improving the long term performance of the individual organizations and the supply chain as a whole".

Some authors define SCM in operational terms involving the flow of materials and products, some view it as a management philosophy, some in terms of a management process and others as an integrated system. According to Christopher (1994), a supply chain is "a network of organizations that are involved, through upstream and downstream linkages, in the different processes and activities that produce value in the form of products and services in the hands of the ultimate customer." An example of a basic supply chain is explained in the below fig 1 by (Chopra and Meindl 2001).



Supply chain includes suppliers, manufacturers, distributors, retailers, and customers. The customers are the main focus of the chain, since the primary purpose of existence of any supply chain is to satisfy customer needs, in the process of generating profit for itself (Chopra and Meindl, 2001). Initially SCM was related to the inventory management. According to Chopra and Meindl (2001), "SCM engages the management of flows between and among stages in a supply chain to minimize total cost". This definition implies that SCM involves management of flows of products, information, and finance upstream and downstream in the supply chain. SCM is a concept, "whose primary objective is to integrate and manage the sourcing, flow, and control of materials using a total systems perspective across multiple functions and multiple tiers of suppliers" (Monczka, Trent and Handfield, 1994). Stevens (1989) stated the objective of SCM was to synchronize the customers' requirements with materials flow to strike a balance among conflicting goals of maximum customer service, minimum inventory management, and low unit costs. SCM is delivering major economic benefits to businesses as diverse as manufacturing, retail, and service organizations, etc. (Horvath, 2001). SCM deals with the total flow of materials from suppliers through end users (Jones and Riley, 1985). An analysis of SCM for manufacturing illustrates the integrated processes required for managing goods from the initial source of supply to point of consumption. It also includes a wide range of activities that material and service suppliers, manufacturers, wholesalers, and retailers have performed for years. Each supply chain participant manages to enhance performance of his own enterprise. Very little concentration is given to the benefits of managing the total supply chain process on an integrated basis (Closs, 1995).

### Evolution of SCM

The SCM concept was coined in the early 1980s by consultants in logistics (Oliver and Webber, 1992). SCM has become one of the most popular concepts within management in general (LaLonde, 1997) since its introduction in the early 1980s (Oliver and Webber, 1992). The evolution of SCM continued into the 1990s due to the intense global competition (Handfield, 1998). Drucker (1998) went as far as claiming there was a paradigm shift within the management literature: "One of the most significant changes in paradigm of modern business management is that individual businesses no longer compete as solely

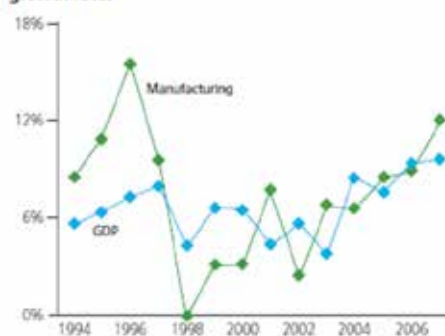
autonomous entities, but rather as supply chains. Business management has entered the era of inter-network competition and the ultimate success of a single business will depend on management's ability to integrate the company's intricate network of business relationships." Fernie (1995) adopted SCM in the National Health Service. In fact, it was the first paper of SCM in the service industry. Sampson (2000) explored the customer supplier duality in the service organizations as it pertained to SCM in the service industry. Kathawala and Abdou (2003) explored supply chain application to the service industry. O'Brien and Kenneth (1996) proposed an educational supply chain as a tool for strategic planning in tertiary education. The study was based on a survey among employers and students. Survey findings revealed that integration and coordination among students and employers should have been promoted. Cigolini et al. (2004) explored a framework for SCM based on several service industries including automobile, grocery, computers, book publishing etc. According to the case study conducted at the City University of Hong Kong, Lau (2007) defined educational supply chain as the 'Student' and the 'Research' supply chain.

The authors emphasized that supply chain must have been viewed as a single entity and that strategic decision-making at the top level was needed to manage the chain in their original formulation. This perspective is shared with logisticians as well as channel theorists in marketing (Gripsrud, 2006)

### Supply chain complexities and challenges in India

Over the last 5 years, a CAGR of 8.6% in India's manufacturing sector as compared to overall GDP CAGR of 7.7% (Figure 1), has fuelled confidence about its resurgent strength and long-term potential. The recently approved 11<sup>th</sup> 5-Year Plan (the central government's planning and budgeting cycle) expects manufacturing to grow at a CAGR of around 10% over 2007-2012.

Figure 1. India YoY Manufacturing and GDP growth rates



Source: CEC Data

Supply chain management provides the ability to capture demands from the market, quickly translate it to supplier requirement and finally fulfill consumer needs. With no single entity competent enough to carry out all the activities in the demand fulfillment process, the entire exercise involves forming alliances with supply chain partners. There are supply chains within supply chains. Supply chains are not monolithic. Senior leaders expect more from their supply chain, with more competition and maturing value chains are leading to a substantial shift in Indian Context.

There is no "one approach". Designing an optimal supply chain configuration that can meet the expected growth

rate is a challenging task in India. Customers demand improvement in each aspect to ensure lower prices. India is facing increasing competition in nearly every product category. The traditional methods of supply chain design and management do not always apply in this Indian context owing to its complex tax regulations, non-standardized transportation, uncertainties across the value chain, and low rate of technology adoption. Nevertheless, companies who have embraced these complexities and designed their supply chains in India are efficiently reaping the rewards of the market size and growth potential that it offers.

Supply chains in India operate in a challenging environment



Source: A.T. Kearney analysis

The above figure shows the supply chain challenges which are similar in any part of the world. The difference lies with respect to altitude and effect of the environment. Building new expectations with dynamic business environment and challenges have created supply chains that have competitive advantage.

**Leading Indian themes differentiating successful supply chains**

1. Collaborating and Integrating the value chain
2. Tailored supply chain to meet the specific demands.
3. Dynamic and frequent planning to meet customer variations.
4. Implement pull across the value chain
5. Integrating rural supply chains

**Collaboration and Integrating :-**

This is to address a range of challenges in India, from demand v/s supply volatility thus improving available time to market while managing cost pressure and reaching remote corners of the country as shown in the fig.

**Examples of Successful collaboration in India**

Business Need or Challenge	Approach and Result
Speed to Market	Consumer packaged goods companies are involving supply chain managers right at the go- concept stage of new product development to factor in supply chain constraints and initiate supply-chain design early, enabling faster time to market
Poor Vendor Capability	A chemical company entered into long term agreements with a few transportation vendors, upgrading their truck infrastructure which has resulted in greater transportation safety and significantly improved reliability
Demand Volatility	A consumer company is collaborating with its dealers to capture daily retail sales information and jointly developing weekly demand forecast leading to a superior service level and fresh products in the market
Increasing Geographical Reach	A telecom company is leveraging the rural distribution infrastructure of a fast moving consumer goods company which improves channel partner viability and benefits both organisations

Cost Inflation	Telecom service providers are sharing their tower infrastructure which reduces operating costs
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Source: A.T. Kearney analysis

**Tailored supply chain approach to meet specific demand :-**

In India there are more diverse product portfolios, geographic locations and channel coverage. Hence, companies have identified unique segments and tailor made their supply chains

**Examples of successfully tailored supply chains in India**

Business Need or Challenge	Approach and Result
Differing service level expectations by Customers	Consumer product companies practice inventory reservation and alternate distribution center mapping to deliver superior service levels to modern trading customers
Margin improvement	Manufacturers of bulk products such as cement, chemicals are disintermediating their own warehouses, by dispatching directly to large customers, to avoid extra handling and storage costs. Similar practices are adopted by consumer good companies managing high volume, low- value products.
Different Product Characteristics	For seasonal products , a company adopted a differentiated replenishment and logistics strategy to minimize unsold stock, meeting 75-80 per cent of demand on forecast and the remaining 20-25 per cent through high cost replenishment
Higher service level at lower cost	A textile company shifted from a 100 per cent made-to-order strategy to made-to-stock strategy for low variability, large volume lines. In addition, it set up a dedicated manufacturing capacity for small volume, high margin lines. These initiatives improved service levels substantially while reducing the total delivery cost.

Source: A.T. Kearney analysis

**Dynamic and frequent planning to meet customer variations:-**

The increased demand volatility requires a close eye on the market. Hence, supply chain in India have adopted both big-picture view and sharp eye with detailing. In practise, the focus tends to be on the immediate month with some long-term planning. More frequent reviews in demand and making adjustments in plans on a weekly basis, thus enables to keep a much closer watch on actual demand and manage demand volatility.

**Examples of Frequent and multi-horizon planning in India**

Business Need or Challenge	Approach and Result
Demand Volatility	A consumer durable company moved from a forecast based monthly planning cycle to a real-time demand based weekly planning cycle. Tracking real time demand more closely is helping the organisation respond faster to volatility

Balance short-term and long term needs	An FMCG company does planning for three different horizons- 3 months, 1 year and 3 years focusing on different objectives that enables it to balance long term view with short term needs
Service high growth	Leading organisations have started mapping future vendor capacity as part of their long term capacity plans
Reduce total delivery cost	Cement companies are using advanced optimization tools to map demand clusters with the factory network. Similar optimization tools are also used by multi-factory consumer goods companies
Manage risk	A packaged foods company conducts a detailed scenario based risk assessment every year and builds strategic buffers across the supply chain

Source: A.T. Kearney analysis

**Implement pull across the supply chain:**

Consumer package goods companies in India have moved from the traditional method to demand-driven replenishment. Automakers have implemented JIT and Kanban based replenishment for on-time delivery/pull system. The method will not be appropriate for new products and for products with short life cycle.

**Examples of Pull Replenishment in India**

Business Need or Challenge	Approach and Result
High service levels at low cost	A consumer goods organization successfully implemented end-to-end pull (customer to vendor) to reduce overall system inventory by 20 per cent while improving service levels by 10 per cent points.
	Replenishment between distribution center and distributor based on actual sales to retail
	Actual stock- based trigger for replenishment between factory and DC
	Vendor managed inventory system for key input materials
	Continuous replenishment system (replenishment triggered by actual inventory at customer vis-a-vis a pre-defined norm) has been implemented by various companies to service their direct distribution network. Leading consumer good companies are implementing initiatives to bring inventory at customer to as close to zero as possible, using a flow through concept to retail

Source: A.T. Kearney analysis

**Integrating the rural supply chain:**

The rural consumers are living in more than 600,000 villages across the country, and constitute over 70% of the population. They account for well over 60% of the national demand for several product categories and have seen their income levels rise over the last 10 years. The number of rural households in the lower and lower middle classes decreased from 83% in 1998-99 to 70% in 2006-07 and is set to fall at a rapid rate over the next 20 years; the comparative fall for urban India has been from 53% to 27%. (NCAER ).

The higher growth rates of rural consumption indicate that companies with an extensive supply chain network will have a better opportunity to serve such growing demand segments and potentially increase market share. This would be a challenging task given the infrastructure, geography and significant channel fragmentation.

**Rural supply chain success stories in India**

Case Study of Lijjat Papad- Owned by Shri Mahila Griha Udyog Lijjat Papad with an objective to **maximize employment opportunities for women** through activities connected with **village industries**, while, at the same time, **not sacrificing basic business principles and quality consciousness**. Being a full-fledged commercial, self-reliant organization and **not a charitable society**. 7 "semi-literate" women in Girgaum, Mumbai. Took over a loss making

papad-making business from Laxmidasbhai A small inconspicuous function of making 4 packets of papad which grew into a workforce of 42,000 women and with a concept of Profit Sharing was adopted since the very beginning, a perfect case to "Create sustainable livelihood out of the skills already possessed" This Organization is by the women, of the women & for the women with a total turnover of Rs. 315 crores, inclusive of Rs.12 crores of Exports

**Nirma** started as a one-product, one-man outfit from a 100 sq ft room in 1969 by Dr. Karsanbhai Patel a Chemist who manufactured phosphate free Synthetic Detergent Powder, and started selling it locally. Nirma became a very successful company within three decades. By the year 1999 the company had multi-locational manufacturing facilities, and a broad product portfolio under an umbrella brand – Nirma. The company's mission was to provide, "Better Products, Better Value, Better Living" contributed a great deal to its success which was also complemented by its distribution reach and market penetration. Nirma's network consisted of about 400 distributors and over 2 million retail outlets across the country. This huge network enabled Nirma to make its products available to the smallest village. In 2007, Nirma purchased the American raw materials company Searles Valley Minerals Inc. - making it among Top-7 Soda Ash manufacturer in the world.

Our country has a rich tradition in dairying since the time of Lord Krishna. India stands first in world milk production with a share of about 14 per cent in world milk production. Thanks to the vision and foresight of Dr. Kurien, in 1970 NDDB (National Dairy development Board) launched "Operation Flood Programme" with objective of ending milk famine in the country and turning farmer's cooperatives into a powerful catalyst for transforming India into a major milk producer in the world. The first phase of "Operation Flood Programme" was between 1970 and 1981 support from Europe through World Food Programme and NDDB's Role was connecting milk sheds with consumers. In this period there was a self-sustaining growth of producer's controlled dairy co-operatives. The second phase was in action during 1981 to 1985, which established 136 milk sheds, 43000 Village Co-operatives and captured markets in 290 cities, and provided 4.9 billion finance. The third phase end of 1994 by capturing 500 cities, 30,000 new dairies with a population target of 300 million customers. Milk has achieved a unique status in terms of its output value exceeding Rs. 1,00,000 crores and has made a rapid stride both in terms of number of milk producers and quantity of milk produced. In India, dairying is the important subsidiary occupation in rural areas engaging 75 million women and 15 million men. Livestock sub-sector alone has contributed to 4.22 per cent of the total value of GDP (Gross Domestic Product). The development of dairy industry in India is well known all over the world.

The **Akshaya Patra Foundation's (TAPF)** demonstrates the success story of public-private partnership between the government and ISKCON (International Society for Krishna Consciousness) group with the purpose of serving nutritious and delicious food to 1.4mn children every day. TAPF is the world's largest Non Profit run mid-day meal program and also the most cost effective mid-day meal provider. The organization is able to feed a child for an entire academic year at a cost of only INR 675. Through operational excellence TAPF could make timely delivery at low cost. This could be achieved from innovative practices being used in the different stages of production and distribution. Economies of scale with centralizing the production and

mechanizing the kitchen having less human intervention is a result of cost efficient meal and also the use of custom-designed vehicles for distribution helps TAPPF to carry more number of containers than the normal vehicles.

**Other supply chain success stories in India**

Another example is of India's leading fast moving consumer goods (FMCG) Company dealing primarily in personal and health care products. Implementation of a distributor information system, to attain visibility of sales data at the retail level and aid supply chain decisions, dramatically improved the company's supply chain responsiveness.

Another success story is about one of India's largest pharmaceutical company, primarily engaged in cardiovascular, antibiotics, respiratory and pain management segments. The company implemented a new production planning system that was capable of handling the complexities and requirements of an aggressive growth strategy. This allowed the company to be more responsive towards its customers, improving its competitiveness.

"X" company's main customers are hospitals that use its products in emergency room surgeries. Customers wanted a high level of product availability. But this was a problem because the company's factories are primarily located in North America and Europe, even though Asia was fastest growing region more than tenfold over the past. It established a Supply Chain Centre of Excellence in India to handle sales and operations planning (S&OP) and supply chain strategy for Asia. The goal was to staff this centre of Excellence with talented supply chain managers. The team's talent was demonstrated by its use of network modelling tools, which requires very skilled practitioners, to recommend a new supply chain network. The network design showed that the company could reduce inventories and write-offs by 25 percent if it had a regional distribution centre in Singapore with the capability to replenish actual demand within 24 hours (order to border) to nearby countries. There are big tax advantages to setting up centralized supply chain operations in Singapore. (Source-Supply Chain Management Review ).

India's market opportunity is significant and appealing enough to continue to attract manufacturers and distributors across sectors.



**Statistics of growth in Indian Business scenario is as below:-**

- 100 Indian Companies have market cap of US\$ 1bn
- 1,000 Indian Companies have received foreign institutional investment
- 125 Fortune 500 companies have R&D bases in India
- 390 Fortune 500 companies have outsourced software development to India
- 2% bad loans in Indian banks (v~20% in China)

80% credit goes to private sector (v~10% in China)

**India's Competitiveness:**

India has been ranked 52 by the Global Competitiveness Report (GCR) out of 59 countries and 39 by World Competitiveness Yearbook (WCY) out of a universe of 47 countries. This enviable image is despite the fact that India, the fifth largest country in terms of Gross National Product (GNP) and Purchasing Power Parity (PPP) (World Bank, 1999), constitutes one of the fastest growing market in the world and is also counted among the richest in regard to cheap skilled labour, scientific and technological resources, and entrepreneurial talents.

**Supply chains positioning in India.**

Positioning of Supply chain in India, considering certain key issues:-

**Geographical positioning:** - Production units and the warehousing facilities are located in relation to the sources of raw material (especially in process based industries), thus to reduce excessive transit times and high transportation costs. Here the strategy and costs are inter-related.

**Allocation of production responsibilities:** - The product mix of different units are so determined so as to maximise the use of production capacities and minimise logistic costs involved. Product customisation is in relation to market demands and the plants where such customisation would take place to retain a high degree of flexibility in resource utilisation.

**Fielding supply chains:** In this competitive environment and with its own operating systems to utilise its strengths, supply chain would carefully formulate and continually review its value proposition to reflect its understanding of the changing customer needs in order to serve and survive as a collective endeavour.

**Supply chain process matrix in Indian context.**

		<u>Medium</u>	<u>High</u>
Level of Interaction Required For the Process	High	Transportation Product Development Manufacturing	Customer Service Demand Management Order Processing/Fulfilment
	Low	<u>Low</u>	<u>Medium</u>
		Import-Export Management Promotions Planning Warehousing	Inventory Management Distribution Management
		Enter-prise	Intra-Enterprise
		Primary Focus of the Process	

**Supply chain process matrix.**

The Supply chain process matrix explains the co-relation between the focus and level of interaction for the processes in Indian context. Enterprise processes have a greater focus on internal processes (e.g. product development, manufacturing) while intra-enterprise covers, processes having greater focus on processes external to the enterprise i.e. oriented towards external stakeholders (e.g. demand management, customer service, order processing/fulfilment). Low level of interaction refers to low to medium level of interaction with other enterprises and/or inter-enterprise processes, while high refers to medium to high level of interaction with other enterprises and/or inter-enterprise processes. Those that involve intra-enterprise interface or integration with high level of interaction with other processes emerge as "highly critical".

Thus Indian organizations collaborate with supply chain processes from product design, product development, logistics, warehousing, market reach, manufacturing and procurement with the objective of cost cutting in the entire supply chain framework.

### Conclusion

This paper has outlined the supply chain practices followed by Indian organizations giving coverage to three dimensions namely, supply chain strategy, supply chain integration, and supply chain success. Indian organizations should further align supply chain strategy with business strategy in order to deliver highest customer satisfaction, streamline processes for supply chain integration to achieve operational excellence, and form partnerships to minimize inventory and maximize profits. In order to achieve this, the power of Information Technology has to be incorporated. The study may help the Indian industry to benchmark their supply chain practices with respect to other developing/developed economies. Supply chains must similarly get the maximum value in their areas of excellence, while carefully avoiding exposing their weaknesses. It involves a dual strategy of fostering trust as well as optimising resources, performance and gains across the supply chain. Successfully accomplishing this twin-objective, requires a reciprocal and continuing commitment of human, technical, and informational resources on the part of supply chain partners.

### Future Scope for research:

This research opens the way for other in-depth studies of some of the critical processes identified for supply chain management practices. Detailed case study analysis of some of these processes are a natural component to the results presented above. Further research can be carried out using a specific case to integrate Indian supply chain strategy with developing / developed economic countries and bench mark each other's strategies. The development of supply chain requires knowledge and expertise about the functioning of the complete chain including strategic aspects i.e. framing strategies pertaining to chain design, chain formulation, chain organization, chain management and partnership and the functioning aspects i.e. chain marketing, chain logistic, quality assurance, material flow, information flow, value addition, technology and interaction. Managing supply chains requires an integrated approach in which chain partners jointly plan and control the flow of goods, information technology and capital from farm to fork and vice versa.

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