Successful Supply Chain Management (SCM) Requires Quality Process Integration, Business Innovation and Technology Management

Mr. PREM NATH PANDAY (ASSISTANT PROFESSOR)
SCHOOL OF BUSINESS STUDIES,
SHARDA UNIVERSITY
KNOWLEDG PARK-III, GREATER NOIDA- 201306
Mob 9891958515  -  premnathpa@gmail.com

Ms. SURUCHI PANDAY (suruchi.panday@gmail.com) Mob. 9990536389
STUDENT-INDIRA GANDHI NATIONAL OPEN UNIVERSITY
NEW DELHI
Abstract
When most people think of innovations they think of product innovations but to mass produce an innovative product at a price that the market will accept a process innovation needs to be first created. Process innovations can also occur to simply reduce the number of steps in an existing process so as to reduce the overall cost of running a process and consequently reduce the cost of the end product.
One particular example of a process innovation is supply chain innovation which if done well can often assist you in gaining competitive advantage

During the last twenty years, supply chain management practices have evolved toward more lean process approaches in order to reduce waste within the overall chain. Concepts such as just-in-time, virtual inventory, supplier rationalization, and reductions in the number of distribution facilities have reduced total supply chain costs, but the result has been increased risk. Business technology management and Business Process reengineering (BRP) are strategically incorporating both operational and infrastructure levels of technology management to ensure that an enterprise’s Global Supply Chain strategy can be realized by the technology it deploys. Organizations are seeking improvements to their own business processes, & recognizing the importance of learning from best practices that have been achieved by other organizations - in The Global Supply chain management (SCM) requires Quality Process integration, Business Innovation and Technology Management.

Successful SCM requires a change from managing individual functions and activities into key Quality & Process integration. Information shared between supply chains partners can only be fully leveraged through process integration. However Firms that manage the crises successfully survived and become high performing organizations. Business technology management by strategically incorporating both operational and infrastructure levels of technology management to ensure that an enterprise’s business strategy can be realized by the technology it deploys.

With the increasing globalization of economic activity and rapid development of Information and Communication Technology, businesses are seeking to develop and organize strategic, efficient and world-wide networks. These networks, which are often referred to as global
logistics, focus on integrating product sourcing, production and distribution. In order to promote such global logistic networks, which are also compatible with sustainability objectives, which needs to be developed and implement with the cohesive transport policies both individually and collectively.

In moving toward a model of operational excellence, a company must first identify its strategic objectives, operational and financial, and then build a set of metrics for measuring progress as well as benchmarking performance relative to industry leaders. For decision-makers, which metrics to measure and how to effectively implement into analyses & can be an acceptable task. To ensure the delivery of high quality products is a main objective for industrial companies. However, with information originating from multiple sources, managing and improving quality can be a very difficult. Although a strong set of tools, processes, and metrics are available, using them to their full potential can be challenging without the right systems in place.

My study is focuses on the learning orientation as one of the technology-management based elements that effect firm performance of the Industry & market demand or technological opportunity that explains inventors’ decisions, supply chain management & the market. This paper (after the study of various Journals and published papers) is an attempt to work on the challenges and success journey which stand behind the Successful Supply chain management (SCM), Quality Process integration, Business Innovation and Technology Management

**Keywords:**
Supply chain management (SCM), Quality & Process integration, Business and Technology Innovation,

**Research Paper:**
Successful Supply chain management (SCM) requires Quality & Process integration, Business Innovation and Technology Management.
Introduction:

Supply chain innovation can make the difference in gaining or losing customers. Supply chain operations are often behind the scenes activities but they have a big influence on an organizations overall competiveness. To remain competitive companies are always striving to reduce defects in products and processes, reduce cycle times, reduce wait times, improve customer service, increase product availability, etc. The global marketplace that we now operate in has further increased the competitive pressures that organizations face. As a result it is more important than ever to take advantage of technological innovations, best practices and process innovations particularly with reference to improving Quality and supply chain.

Supply chain innovation is about applying best practices and technological innovations to supply chain in order to reduce such cycle and wait times and other waste (to use a Lean term) in your processes. This should have an ultimate goal of improving the customer experience. Give your customer more choice, more accuracy, faster order fulfillment, increased visibility and better service by looking at areas in your supply chain where you can develop new practices / better ways of working. India presents a unique business challenge has a large potential untapped market of size equal to that of the rest of the world (excluding China) require affordable quality products to be designed innovative mechanism to produce and distribute sound business built on values.

**SCM enables:** The Art and Science of Negotiation, Procurement and Supplier Management, Evaluation and negotiation skills to ensure effective procurement while maintaining supplier relationships: methods to evaluate and source materials and services; development of negotiation skills for effective and ethical results. Strategic Supply Chain Management assets and configure processes in a firm's supply chain that enable it to develop operational competencies that are aligned with its competitive strategy. Planning, implementing and controlling the production and distribution of goods and services: production planning and scheduling; inventory management; the design and management of supply and distribution networks. Logistics planning and implementation of resources to achieve business objectives Fundamentals necessary for the analysis and management of business processes: concepts
include capacity management, effects of work-in-process, inventory, and process variability on performance, process improvement and quality.

The Lean manufacturing, supplier development and supply chain transformation program in the organization, progressive manufacturing organizations can reap a number of benefits across multiple functions including: Lean supply chains. Organizations can be enhanced, and they can become drivers of superior customer service performance and increased margin capture. Organizations need to extend their Lean journeys, & Lean supply chains are the next logical step in Business Resource Planning system (BRP). Continuous Process Improvement has been described using a number of models, & the system approach or ADDIE (Analysis, Design, Development, Implement, and Evaluate) model.

Research can established a list of the most important metrics for the executive including the cost of quality, overall equipment effectiveness, and percentage of products in compliance, on time and complete shipments, and new products introduction. The structured approach is used by enterprises to align the technology and business management for the purpose of ensuring better execution, risk control and profitability.

Performing an impact assessment on BTM (Business Technology Management) consists of: the extent of the change proposed, key differences in the changed state from a point of reference in BTM or in the original state, & Make a decision by using the results. Quality management plays an important role in every part of the value chain, which includes Supply-Chain Management (SCM), Product Lifecycle Management (PLM), Customer Relationship Management (CRM), Manufacturing Operations Management (MOM), and Environment, Health and Safety (EHS). Because of the direct impact quality has on each of these areas, it can be strategically utilized as the centerpiece for managing operations. Facilitating this infusion are advancements in the connection between business processes and IT, which is a driving force behind the emerging solutions category. This integration will enable companies to effectively share design information with manufacturing and establish a closed-loop collaboration process. Each touch point should be matched with a series of functionalities and processes specific to that area. Traditionally, many of these processes have been standalone and do not effectively communicate with one another. To create a
closed-loop environment, companies need to integrate technology and processes, which is often a significant roadblock for many organizations. Integrating product lifecycle management (PLM) with the quality management system will help companies deliver functionalities for setting quality standards in the design process to manufacturing and the field. Many of these capabilities can be utilized well before the product has moved to manufacturing for production. Statistical Process Control (SPC) is another tool that is better deployed through an integrated Environment management system. SPC aims to create as little waste and downtime as possible in processes, measuring and controlling the underutilization of resources with advanced data modeling tools. Depending on the industry, these touch points can also improve compliance and help reduce operational risk. Business Technology Management (BTM) is a methodology & concept, or eventually the aggregation of several guidelines and techniques. It is also described as a management science which aims to unify business and technology business strategies, which aims for extracting the full potential value of business technology solutions, & it allows you to unify business and technology decision making. Business Technology Management corresponds to a group of various services intended to help businesses management. BTM can include different methods such as Information Technology planning, Project and Portfolio management, Business support, Database services, disaster recovery, network management, security, document service, and frameworks. There is a need to integrate these capabilities to achieve that strategic business technology alignment because most of these methods do not really focus on the goals and objectives of an enterprise, a performance measurement methodology, Six Sigma or Lean are quality improvement methodologies mostly used in manufacturing. Business Technology Management addresses four critical dimensions of enterprise-wide strategy.

The globalization and the proliferation of multinational companies, joint ventures, strategic alliances and business partnerships, significant success factors were identified, complementing the earlier "Just-In-Time", "Lean Manufacturing" and "Agile Manufacturing" practices. Technological changes, particularly the dramatic fall in information communication costs, which are a significant component of transaction costs, have led to changes in coordination among the members of the supply chain network.
**Process:** This first dimension refers to the institution of a set of robust, flexible and repeatable processes, broadly defined as:

- General quality of Business Practice: Doing the right things
- Efficiency: Doing things efficiently, quickly with little redundancy
- Effectiveness: Doing things well

**Information:** Valid, effective, timely provision of information is a prerequisite in effective decision making. Information must be delivered in a way that is comprehensible, may be included for strategic and operational objectives.

**Technology:** Effective technology can help connect the other three dimensions. The idea is that technology plays a vital role in all processes and can enable timely information sharing, improve co-ordination between members of an organization and makes processes easier to execute, the automation of tasks, reporting, analytics and integration between management systems.

**Successful supply chain management:** Successful supply chain management with innovative practices helps to identify gaps and inefficiencies in the value chain and is founded on technology and broad-based business process integration initiatives. Technology plays an important role in production control and distribution planning, logistics, and inventory management, and it helps overcome language, currency, and time zone differences. But the most important benefit that technology brings to the supply chain remains the ability for companies to integrate their business processes, collaborate in a real-time environment, and convert information into actionable reporting.

- Supplies an accessible introduction to standardized work, from a cyclic perspective
- Explains how to instill and maintain quality in work processes right from the get go
- Provides the foundational basis required to apply standardized work concepts to a wide range of work situations

In relationship of the work period and the time, as well as the importance of the three main works interface levels in job design for Product Process Improvements. Technology is playing an increasing role in enterprise growth, innovation and operational performance
while technology’s definition now incorporates new combinations of traditional IT systems, consumer devices and their respective services. Applying technology as part of amplifying the enterprise reflects both the changing nature of business strategies, and executive expectations about the role of technology in realizing those strategies. Amplifying products, services and operations requires an enterprise to strengthen the customer experience and send clearer market signals. The main responses of business firms to a rapidly changing environment have included these;

• Reengineering: Appointing teams to manage customer-value building processes and trying to break down department walls between functions.
• Outsourcing: A greater willingness to buy more goods and services from outside vendor when they can be obtained cheaper and better this way.
• Benchmarking: Studying “best practice companies” to improve the company’s performance.
• Supplier partnering: Increased partnering with fewer but larger value-adding suppliers.
• Customer partnering: Working more closely with customers to add value to their operations.
• Merging: Acquiring or merging with firms in the same industry to gain economies of scale and scope.
• Globalizing: Increased effort to both “think global” and “act local.”
• Flattening: Reducing the number of organization levels to get closer to the customer.
• Focusing: Determining the most profitable businesses and customers and focusing on them.
• Empowering: Encouraging and empowering personnel to produce more ideas and take more initiative.

Management Science - Importance of Product Process Improvements: Product Process Improvements are clearly important to almost every firm – many manufacturers rely upon third-party suppliers for half or more of their value added – and the attention to security of supply is warranted. And in fact some Product Process Improvements are so critical that going with them is an appropriate decision, one that can reward your firm’s shareholders.
Product Process Improvements are critical to their customer’s ability to shorten product development cycles and get new products to market quickly. Process Improvements play a vital role in helping their customers to successfully enter a new geographic market with unique requirements due to regulation, culture, or other factors. The list of contributions that involve factors other than product cost or security of Process Improvements is nearly endless, customer’s market position and profitability.

Quality and Continuous Process Improvement (CPI) is a never ending effort to discover and eliminate the main causes of problems in Product Process Improvements. But when we engage in process improvement, we seek to learn what causes things to happen and then use this knowledge to:

- Reduce variation.
- Remove activities that have no value to the organization.
- Improve customer satisfaction.

Continuous Process Improvement has been described using a number of models, & the system approach or ADDIE (Analysis, Design, Development, Implement, and Evaluate) model. Successful supply chain management with innovative practices helps to identify gaps and inefficiencies in the value chain and is founded on technology and broad-based business process integration initiatives. Technology plays an important role in production control and distribution planning, logistics, and inventory management, and it helps overcome language, currency, and time zone differences. But the most important benefit that technology brings to the supply chain remains the ability for companies to integrate their business processes, collaborate in a real-time environment, and convert information into actionable reporting - a “must have” for organizations to thrive in today’s high-speed global business environment. When all parties are connected, only then can decision makers be provided with a clear enough overall pictures of their businesses so they can determine where problems lie and opportunities reside.

By structural change, there are five forms of structural change of the supply chain including:

- Forward and backward integration,
- Major process simplification,
• Changing the configuration of factories, warehouses, or retail locations,
• Major product design,
• And Outsourcing logistics to a third party. In term of improvement in infrastructure, its objective is similar to structural change.

To remove the sources of uncertainty is or times from the supply chain ways are:
• Cross functional teams,
• Partnerships,
• Setup time reduction,
• Information systems and Cross-docking.

As since electronic commerce is enabling supply chain management in many ways. The internet makes it possible to process information more rapidly and provide information not previously available and internet has enabled companies to sped up their supply chains and reduce costs.

**Intensive education:** Intensive education of workers and management at all levels is needed, With a Just in Time system in hand helps reduce the setup time as much as possible, ideally to zero. Low setup times result in small economical lot sizes and shorter production lead times. Driving down the setup time for machines is a key to the JIT system. With shorter lead times and less material in process, the production system is also much more flexible to changes in the master schedule. To management must provide leadership and support. The final assembly schedule must be leveled, followed by leveling of fabrication processes and supplier schedule. Lot sizes and lead times must be reduced for all stages of production. An analysis of successful companies around the world suggests that their successes are partly dependent on their ability to apply IT to SCM. In today’s highly competitive environment companies, big or small, need to improve effectiveness and efficiency. SCM, as a major part of business operations, plays an important role for organizations to achieve competitive advantage. Integration of the transportation planning system with the warehouse legacy system will enable load planning results to trigger the printing of shipping documents and the picking/loading process. In addition to the outbound domestic business of the company, inclusion of international and subsidiary shipments could drive even greater shipment consolidations when brought into the
The ability to determine cost effective direct shipments from manufacturing sites to the customer is another future enhancement in the planning stages. This enhancement would provide a more systematic approach to the direct shipment determination using both load optimization and rating technology and would eliminate the manual efforts used currently. Transferring from a reactive mode to a proactive mode, by planning shipments prior to manufacturing would provide earlier visibility to future loads enhancing the load optimization process.

Innovation has been defined as “the design, invention, development and / or implementation of new or altered products, services, processes, systems, organizational structures, or business models for the purpose of creating value for customers and financial returns for the firm”. In our modern world often as important as the innovation management process is the management and organization of the firm’s knowledge as an enabler to innovation. Technology is often used to support the knowledge management initiatives that assist in promoting the innovation process, often in the form of knowledge management tools. The management of technology and innovation can refer to using / managing technology tools and resources as an enabler to innovation and it can also refer to the using / managing technological breakthroughs in SCM as the catalyst to new innovative products and or processes.

**The Supply chain risk:** The Supply chain risk – real supply chain risk, not every single concern either a vendor or a customer could have about manufacturing a product – needs focus to be able to address the concern, everything is priority number one. Consider the nature of the challenges that we are trying to address, and the nature of the challenges our industry faces, and consumers of technology to help improve everyone’s supply chain risk management practices & Applications of Supply Chain Management in Products and Process Improvements as a Management Science is the confidence level of consumers - in technologies.

Information sharing is an essential prerequisite for securing information accessibility to all supply chain partners involved in logistics operations. The creation of distributed databases fosters the supply chain. In addition, the availability of consistent information improves
decision-making processes for operators. Data sharing has always been important in the transport and logistics service industry. Access to and availability of information in development of relationships with other operators in intermodal transport, for instance, contribute to substantially reduced processes and thus time savings in freight transfer from one mode of transport to another and to minimize errors in drawing up freight documentation, thereby increasing overall transport efficiency.

Summary & Conclusion: In order to have the best decision in the process selection, company have to consider market conditions, capital requirements, labor, management skills, raw materials, and technology. The process selection decision must be strategic and cross-functional in nature. Regarding the choice of technology, company also has to consider not only net present value, but also the effects on customers, employees, and the environment. Also, a cross-functional strategy is needed to ensure that technological choice is integrated over time and help the company achieve a competitive advantage. To succeed, managers should seek to understand the performance characteristics of technology and resource planning systems need to be integrated not only operations information, but information from marketing, finance, and human resources.

In term of inventory, with an independent-demand inventory system in place, the company can:

- protect against uncertainties,
- allow economic production and purchase,
- Cover anticipated changes in demand and supply, and Provide for transit.

Simultaneously, inventory systems will provide a clear picture of types of costs involve for operations managers to consider. These types of costs are item cost, ordering cost, carrying cost, and stock out cost. It should be noted that the carrying cost usually consists of three components: cost of capital, cost of storage, and costs of obsolescence, deterioration and loss. The inventory management is a cross-functional problem. Marketing department may be interested in minimizing the stock out costs associated with lost sales. Accounting and finance department may be interested in minimizing the amount of inventory that needs to be financed. Operations may want a sufficient level of inventory to assure smooth scheduling and production control.
Meanwhile, a comprehensive supply chain strategy should include the following elements:

- Customer service requirement,
- Plant and distribution center network design,
- Inventory management,
- Outsourcing and third-party logistics relationships,
- Key customer and supplier relationships,
- Business process,
- Information system,
- Organizational design and training requirements,
- Performance,
- Performance goals.

**New e-services:** One of the first visible effects is the integration of traditional services (transportation and warehousing) with “information-based services”. Although transport and logistics companies have used telecommunication systems and networks for some time, the sector may not be considered a leader in the field of technological innovation. However, over the last few years firms operating in the sector have made significant progress in their adoption of new technologies, particularly those linked to the Internet and e-business. Low-cost access to the Web and the dissemination of e-business technologies have provided these firms with a tool to satisfy customer demand by using traditional services in conjunction with growing information-based services. Today, the main transport and logistics service firms are in a position to provide a variety of information via the Internet and to secure transactions online with customers. However, the range of online initiatives appears to be somewhat diversified. There are firms that initially used their own web sites as electronic service catalogues. Some firms have started to offer tracking and booking services, while others have tried to create competitive advantage by developing signature options unique to their brands.

**New functions:** The dissemination of Information and communications technology (ICT) has opened up new opportunities for the development of new roles and functions in the supply
chain, the so-called on-line freight e-marketplaces. The purpose of these web-based intermediaries is to give added value to transport and logistics businesses through greater efficiency and information transparency. They run Internet transport portals which bring together buyers and sellers of transport services and make communication between them faster.

**Strategic Successful Supply chain management (SCM) requires Quality Process integration, Business Innovation and Technology Management broad challenges faced are:** Integrating Consumer Products and Operational Excellence: As many executives in the industry already realize, the following 5 challenges highlighted are highly interconnected:

1. Changing Consumer Demands: Today, Demand has a tendency to fluctuate rapidly. Consequently, manufacturing success is closely related to time-to-market and new product introduction (NPI) capabilities. Additionally, demand can fluctuate cyclically and with economic volatility. The success and profitability of any organization in this industry is heavily dependent on how effective these companies are at addressing the changing demands.
2. Shrinking Operating Margins: With global competition, companies are faced with the challenge of meeting global price points. This creates additional pressure, as manufacturers need to ensure the delivery of high quality products while finding innovative ways to cut costs.
3. Compliance and Regulatory Pressures: The global regulatory environment is dynamic. Companies are faced with the challenges of mitigating operational risk and managing non-conformances. Creating additional pressures, as manufacturers rely on the global supplier network to battle shrinking operating margins, meeting international compliance and regulations becomes a factor.
4. Globalizing Economy: Leveraging the global supplier network is a means for reducing costs; however it does come with numerous risks in terms of compliance, product safety, and other areas.
5. Data Granularity and Visibility: With compliance and regulations becoming stricter, traceability functionalities are more pertinent and requisite than in the past. The companies need strong data granularity to reduce operational risk, properly respond to an adverse event with a targeted recall, provide high quality and compliant products, and avoid counterfeiting issues associated with global trade.
Strategic Successful Supply chain management (SCM) requires Quality Process integration, Business Innovation and Technology Management. - Network Design & Optimization:

- Accurate data and business plans should be used
- Socio-economic factors should also be considered before selecting a network
- Network planning and refinement should be done periodically and systematically
- Use of quantitative techniques such as Mixed Integer Linear Programming constructs lends more accuracy to the exercise

There will be tremendous scope to further improve upon the Successful Supply chain management (SCM), Quality Process integration, Business Innovation and Technology Management, and even more important, to use supply chain innovation for gaining competitive advantage through quality management. Supply chain best practices at all level, improving forecasting accuracy, reducing out of stock, increasing quality sourcing efficiency, increasing product movement visibility, reducing lead time (sourcing, distribution), optimizing transportation etc. On a long term basis, supply chains would need to be built flexible, in order to respond to changes, drastic or slow & supply and technology. Further, flexible supply chains would allow SCM players to tackle any dramatic events like natural calamities, terrorism, etc. Aligning the supply chain strategy to the business strategy would be of paramount importance in order to make strategic decisions more effectively, like entering new markets, new product introductions, new mode of sales, etc. Anticipating the future and building a supply chain, Quality Process integration, Business Innovation and Technology Management around it, is another way of looking at what the customer behavior would be in the long term.

Supply Chain Management is an integrated with the efficient flow of materials, products, and information within and among organizations. Supply chain management involves the integration of business processes across organizations, from material sources and suppliers through manufacturing and processing to the final customer. The design of Successful Supply chain management (SCM) requires Quality Process integration, Business Innovation and
Technology Management analysis, and management of production processes to improve performance, and their relationships;

- process design and evaluation;
- And managerial levers for improving and controlling process performance.

The application of decision models for Successful Supply chain management (SCM) requires Quality Process integration; Business Innovation and Technology Management which are the key factors. To survive in these tough times, companies need to effectively assess the priority and criticality of the challenges, developing strategies to effectively overcome them for Successful Supply chain management (SCM), Quality Process integration & Business Innovation.
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