

POTENTIAL OF INFORMATION SYSTEM IN SUPPLY CHAIN MANAGEMENT

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ABSTRACT

Supply chain management information system (SCM IS) have become vital tools for synchronizing information among the customers and suppliers of a supply. However, recent advances in inter systems and business technologies have led to a confusing variety of SCM IS alternatives, each with varying capabilities used to determine the levels of support an SCM IS should provide to enable operational efficiency, flexibility, and planning and analysis capabilities.

Keywords, Supply Chain, Management, Information, System

INTRODUCTION

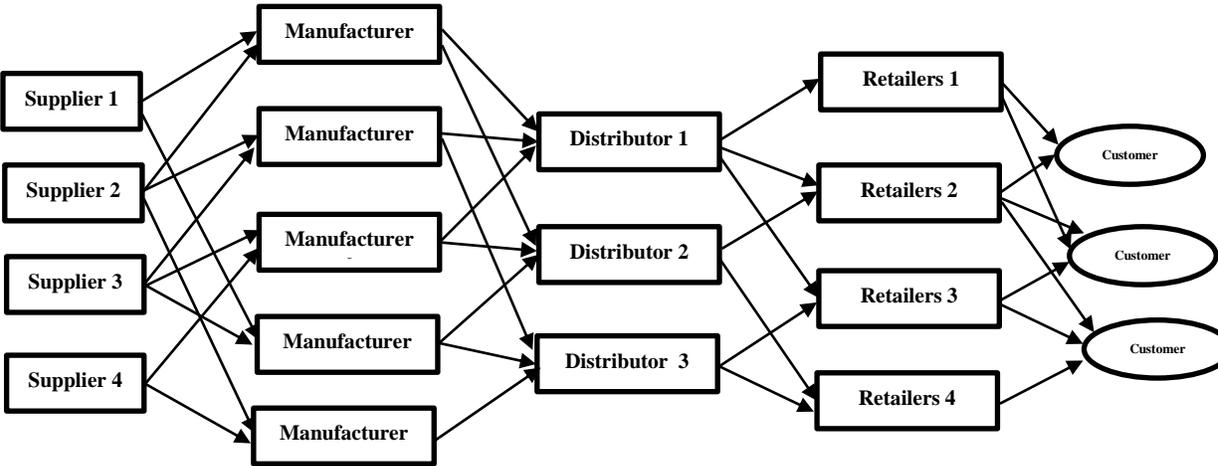
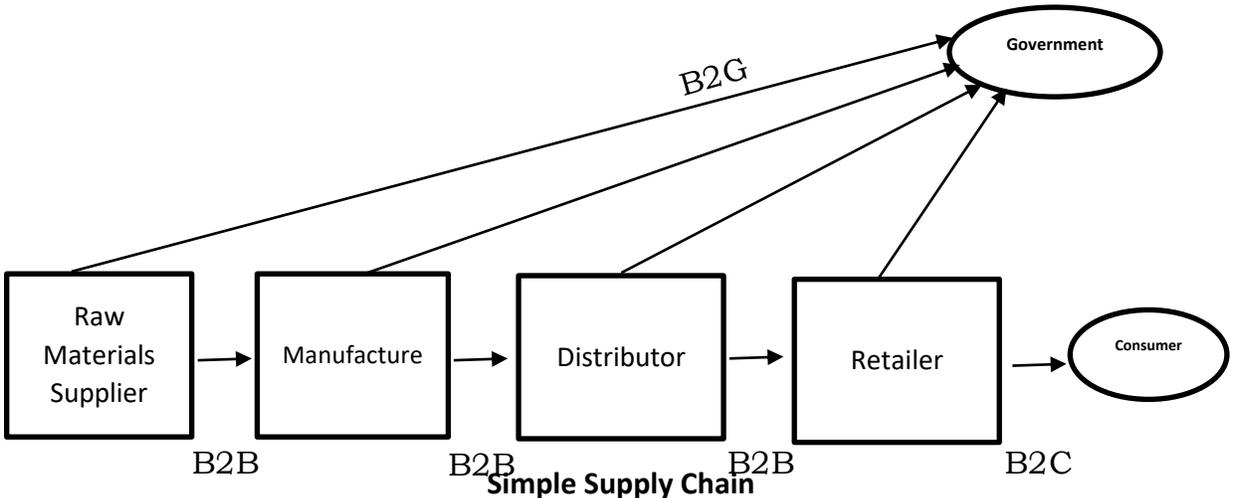
Companies have consistently tried to enhance their business efficiency and effectiveness, by reassessing their internal business operations such as purchasing, warehousing, materials management and distribution. These processes commit huge time and financial resources and therefore companies are continually striving to make them more effective in order to improve their financial standing and market positions (Chaffey, 2003). This has involved Manufacturing Resources Planning (MRP II) and just-In-Time (JIT). However, businesses in today's highly competitive global market place require reassessing their business operations and examining both internal processes and external linkages with business partners to satisfy the changing needs of their customers, react to the actions and new business models of their competitors and opportunities afforded by new technologies (Umoh, 2009). They must offer products, which fully satisfy customer demands as well as trying to anticipate future demands. Therefore, supply chain management (SCM) is coming under increasing scrutiny in trying to achieve this competitive advantage as it provides many opportunities for reducing operating costs and improving customer service and satisfaction. More common and accepted definitions of Supply Chain Management are:

- "Supply chain management is the management of the interconnection of organizations which relate to each other through upstream and downstream linkages between the different processes that produce value in the form of products and services to the ultimate consumer".
- Supply Chain Management 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.

- Global Supply Chain Forum-Supply Chain Management is the integration of key business processes across the supply chain for the purpose of adding value for customers and stakeholders.

Supply chain management (SCM) is a broadened management focus that considers the combined impact of all the companies involved in the production of goods and services, from suppliers to manufacturers wholesalers to retailers to final consumers and beyond to disposal and recycling. This approach to managing, production and logistics networks assumes all companies involved in the process of delivering goods to consumers are part of a network, pipeline, or supply chain. It encompasses everything required to satisfy customers and includes determining which products they will buy, how to produce them, and how to deliver them. The supply chain philosophy ensures that customers receive the right products at the right time at an acceptable price and at the desired location (O, Brien, 2007).

Companies that practice supply chain management report significant cost and cycle time reductions. For example, Wal-Mart Stores Inc. announced increases in inventory turns, decreases in out-stock occurrences, and a replenishment cycle that has moved from weeks to days to hours.



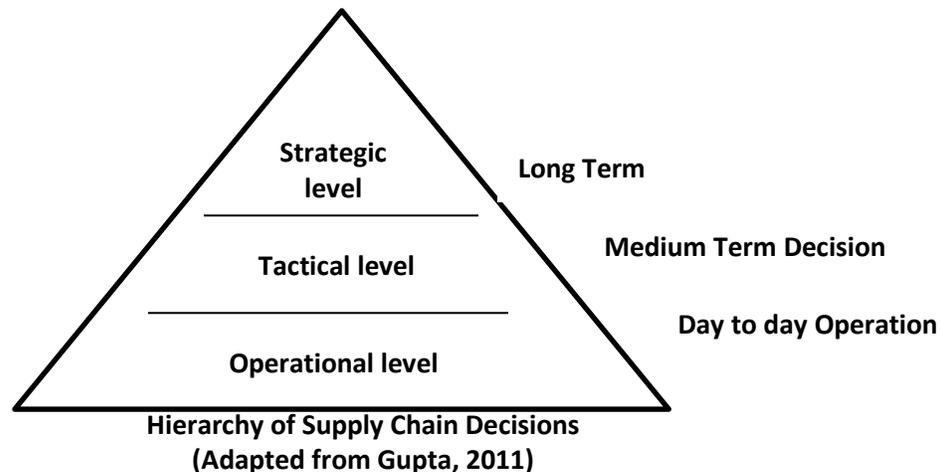
Complex Supply Chain (adapted from Gupta, 2011)

Benefits of SCM:

- ✓ Reduces production and distribution costs
 - i. More information
 - ii. Less inventory, less lead times needed
- ✓ Improves timeliness of shipments
 - i. Increases supply chain “velocity”
 - ii. More accurate fulfillment
 - iii. Improves “visibility” of supply chain
- ✓ Fewer employees needed to manage supply chain
- ✓ Better customer satisfaction: less stock-outs
- ✓ Strategic relationship with suppliers, enables new business partnerships:
 - i. Collaborative Planning, Forecasting, and Replenishment systems (CPFR)
 - ii. Collaborative downstream customer service, marketing, and relationship management.

Supply Chain Management Decisions Levels

- Strategic Level
- Tactical Level
- Operational Level



Strategic Level: On the strategic level long term decisions are made. These are related to location, production, inventory, and transportation. Location decisions are concerned with the size, number, and geographical location of the supply chain entities, such as plants, inventories, or distribution centers. The production decisions are meant to determine which products to produce, where to produce them, which suppliers to use, from which plants to supply

distribution centers, and the way of managing inventories throughout the supply chain. Transport decisions are made on the modes of transport to use. Decisions are made on the strategic level are of course interrelated. For example, decisions on mode of transport are influenced by decisions on geographical placement of plants and warehouse, and inventory policies are influenced by choice of suppliers and production locations. Modeling and simulation is frequently used for analyzing these interrelations, and the impact of making strategic level changes in the supply chain. On the tactical level medium term decisions are made, such as weekly demand forecasts, distribution and transportation planning, production planning, and materials requirement planning. The operational level of supply chain management is concerned with the very short term decisions made from day to day. The border between the tactical and operational levels is vague. Often no distinction is made.

The Components of Supply Chain Management are:

- ✓ Demand planning (forecasting)
- ✓ Demand collaboration (collaborative resolution process to determine consensus forecasts)
- ✓ Order promising (When one can promise a product to a customer taking into account lead times and constraints)
- ✓ Strategic network optimization (what plants and DC's should serve what markets for what products) (monthly-yearly).
- ✓ Production and distribution planning (Coordinate the actual production and distribution plans for a whole enterprise) (daily).
- ✓ Production scheduling (For a single location create a feasible production schedule) (minute by minute).
- ✓ Transportation planning (For multiple supply, manufacturer, distributor and warehousing points in a network).
- ✓ Transportation execution (Enactment of long term plans on a per shipment basis, typically performed by focused organizations called forwarders).
- ✓ Tracking and measuring (An ever increasing aspect of supply chain management designed to highlight potential against the plan and possible process improvements).
- ✓ Plans of reduction of costs and management of the performance (diagnosis of the potential and the indicators, the organization and pacification strategic, master's dysfunctions in real time, evaluation and accounting reporting, evaluation and reporting quality).

Classification of Supply Chain Management Classified into two types:

(a) Supply chain planning system:

- Generate demand forecasts for a product.
- Develop sourcing and manufacturing plans for that product
- Make adjustments to production and distribution plans, and
- Share that information with relevant supply chain members.

One of the most important supply chain planning functions is demand planning, which determines how much product a business needs to make to satisfy all of its customers' demands.

- (b) *Supply chain execution system*: Physical flow of products through distribution centers and warehouses to ensure that products are delivered to the right locations in the most efficient manner.

Supply Chain Business Process Integration

Successful SCM requires a change from managing individual functions to integrating activities into key supply chain processes. An example scenario: the purchasing department places orders as requirements become known. The marketing department, responding to customer demand, communicates with several distributors and retailers as it attempts to determine ways to satisfy this demand. Information shared between supply chains partners can only be fully leveraged through process integration involves collaborative work between buyers and suppliers, joint product development, common systems and shared information. According to Tan (2001), operating an integrated supply chain requires a continuous information flow. However, in many companies, management has reached the conclusion that optimizing the product flows cannot be accomplished without implementing a process approach to the business. The key supply chain processes are;

- Customer relationship management
- Demand management
- Order fulfillment
- Manufacturing flow management
- Supplier relationship management
- Product development and commercialization
- Returns management

The Management Components of SCM

The SCM components are the third element of the foursquare circulation framework. The level of integration and management of a business process link is a function of the number and level, ranging from low to high, or components added to the link. Consequently, adding more management components or increase the level of integration of the business process link. The literature on business process re-engineering, buyer-supplier relationships and SCM suggests various possible components that must receive managerial attention when managing supply relationships. The following components are:

- Planning and control
- Work structure
- Organization structure
- Product flow facility structure
- Information methods
- Power and leadership structure
- Risk and reward structure

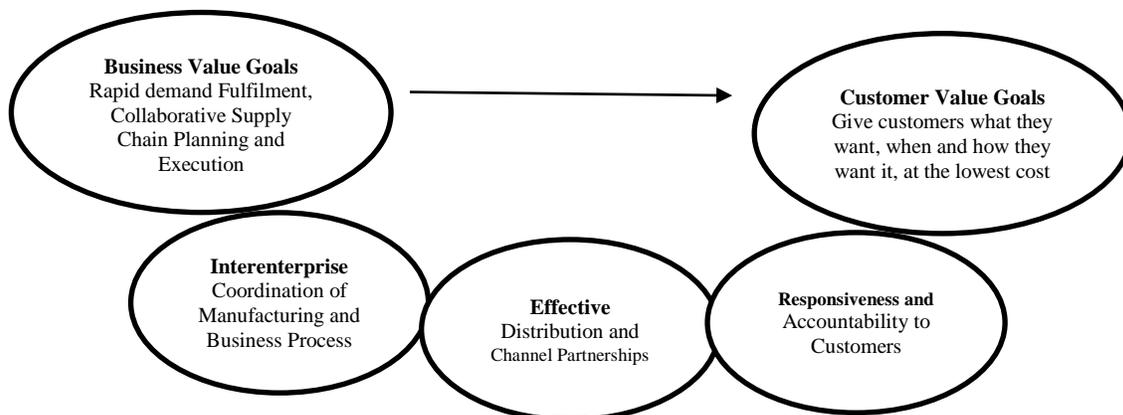
Supply chain management information system (SCMS)

Supply chain management helps a company get the right products to the right place at the right time. In the proper quantity and at the acceptable cost. The goal of SCM is to efficiently manage this process by forecasting demand, controlling inventory, enhancing the network of business relationship a company has with customers, suppliers, distributors and

others, and receiving feedback on the status of every link in the supply chain. Supply chain management is a Cross-Functional Inter-enterprise System that uses information technology to help support and manage the links between some of a company's key business processes and those of its suppliers, customers and business partners. The goal of SCM is to create a fast, efficient and low cost network of business relationship, or supply chain to get a company's products from concept to market. The objective is to significantly reduce costs, increase efficiency, and improve their supply to improve inter-enterprise coordination among supply chain process players. The result is much more effective distribution and channel networks among business partners.

Objectives of Supply Chain Management Information System (SCMIS)

Supply Chain Management (SCM) enables collaboration, planning, execution, and coordination of the entire supply network, empowering firms to adapt your supply chain processes to an ever-changing competitive environment. SCM can help into a responsive supply network-in which communities of customer-driven companies share knowledge, intelligently adapt to changing market conditions, and proactively respond to shorter, less predictable life cycles.



(Adapted from McLaren, et al. 2002)

- 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 effort the supply chain expends in filling the customer's request.
- To achieve maximum supply chain profitability. Supply chain profitability is the total profit to be shared across all supply chain stages.
- To reduce the supply chain costs to the minimum possible level.
- To ensure smooth flow of material, information and finance between and among stages in a supply chain to maximize total profitability.

The basic objective of SCM is to ensure value for both the business and the customers.

Benefits of Supply Chain Management Information System (SCM IS)

- Increase in overall efficiency

- Fast order processing
- Reduction in cycle time
- Eliminate wastage
- Provides competitive advantage
- Eliminate inventory quality problem
- Provides business intelligence tools like Data Mining etc.
- Gives new ways to access the enterprise information for daily activities
- Enhances inter enterprise and intra-enterprise coordination
- Strengthens firm's relationships with suppliers, distributors, wholesalers, retailers
- Reduction in cost
- Order tracking made easy
- Quicker transportation of material to market
- Strategic relationship with suppliers
- More accurate order processing
- Demand forecast made easy

Information to be Contained in Supply Chain Management Information System (SCM IS)

1. **Production:** What products does the market want? How much of which products should be produced and by when? This activity includes the creation of master production schedules that take into account plant capacities, workload balancing, quality control, and equipment maintenance.
2. **Inventory:** What inventory should be stocked at each stage in a supply chain? How much inventory should be held as raw materials, semi-finished, or finished goods? The primary purpose of inventory is to act as a buffer against uncertainty in the supply chain. However, holding inventory can be expensive, so what are the optimal inventory levels and reorder points?
3. **Location:** Where should facilities for production and inventory storage be located? Where are the most cost efficient locations for production and for storage of inventory? Should existing facilities be used or new ones built? Once these decisions are made they determine the possible paths available for product to flow through for delivery to the final consumer.
4. **Transportation:** How should inventory be moved from one supply chain location to another? Air freight and truck delivery are generally fast and reliable but they are expensive. Shipping by sea or rail is much less expensive but usually involves longer transit time and more uncertainty. This uncertainty must be compensated for by stocking higher levels of inventory. When is it better to use which mode of transportation?
5. **Information:** How much data should be collected and how much information should be shared? Timely and accurate information holds the promise of better coordination and should consist of information regarding the above mentioned components via each supply chain member i.e. manufacturer, supply distributor, warehouse, retailer and customer.

Future

Supply chain management information system is an evolving process. It is much like the philosophies of total quality management (TQM) or business process reengineering in that there is no stopping point. Emerging technologies and successful supply chain management techniques used by companies today are the foundation of future improvements in techniques and technologies. Supply chain management can provide great payoffs in cost and efficiency to the organization.

Enabled with improving technology and a broader view of the organization, supply chain management addresses the issues of complexity and competition by exploiting and enhancing the chain to provide strategic, financial, and competitive advantage.

CONCLUSION

World is shrinking day by day with advancement of technology. Customers' expectation are also increasing and companies are prone to more and more uncertain environment. Companies will find that their conventional supply chain integration will have to be expanded beyond their peripheries. The strategic and technological innovations buy and sell in the future. However clear vision, strong planning and technical insight into the internet's capabilities would be necessary to ensure that companies maximize the Internet's potential for better supply chain management and ultimately improved competitiveness. Internet technology, World Wide Web, electronic commerce etc. Will change the way a company is required to do business. These companies must realize that they must harness the power of technology to collaborate with their business partners. That means using a new breed of SCM application, the internet and other networking links to observe past performance and historical trends to determine how much product should be made as well as the best and cost effective method for warehousing it or shipping it to retailer. One of the biggest benefits technology has given to the supply chain concept is the ability for companies to collaborate. These collaborations are designed for the benefit of all parties.

REFERENCES

- Chaffey, D. (2003). *Business Information Systems*: New York. Prentice Hall.
- Gupta, H. (2011). *Management Information System. An insight*. India Informational Book House PVT. Ltd.
- Laudon, K. C and Laudon, J. P. (2003). *Essentials of Management Information System*. New York: Prentice Hall.
- O. Brien, J. (2001). *Introduction to Information Systems*. New York McGraw-Hill.
- O' Leary, D. E. (2000) 'Supply Chain Processes and Relationship for Electronic Commerce', in T. Strader and A. Whinston (Eds.) *Handbook on Electronic Commerce*, Berlin, Heidelberg, Germany: Springer-Verlag.
- Tan, K. C., 2001. A framework of supply chain management. *Journal of Purchasing and Supply Management* 71, pp. 39-48.
- Umoh, G. I. (2009). *Management Information System with practical case studies*. Nigeria: The Blueprint Ltd.

