Supply Chain Management

“Supply Chain Management encompasses the planning and management of all activities involved in sourcing and procurement, conversion, and all Logistics Management activities. Importantly, it also includes coordination and collaboration with channel partners, which can be suppliers, intermediaries, third-party service providers, and customers. In essence, Supply Chain Management integrates supply and demand management within and across companies”.

Council of Supply Chain Management Professionals (CSCMP)

Supply Chain Collaboration

Collaboration can best be described as an inter-organizational relationship type in which the participating parties agree to invest resources, mutually achieve goals, share information, resources, rewards and responsibilities as well as jointly make decisions and solve problems (Soosay et al. 2008).
Supply Chain Collaboration

There has been a significant shift in supply chain relationships since 1998. “… In 1998, orders were received mainly by phone and fax, with relatively long lead-times, little product differentiation and limited data sharing. In 2008, ordering is undertaken by means of electronic data interchange (EDI) on a just-in-time basis with many different promotional packs and extranet data sharing. Overall, … the relations in 1998 were transactions while they are now considered to be collaborative partnerships.”

Meinir Hughes, Customer Logistics Controller, Coca-Cola UK - Logistics Directors Forum, 2008

Supply Chain Collaboration

Typical components of collaboration include:
- Shared vision
- Trust
- Sharing information
- Joint planning
- Joint problem solving
- Joint decision-making
- Openness
- Shared risk
- Shared rewards

Soosay et al. 2008

Supply Chain Collaboration

SCM research suggests that there is still no consensus as to which supply chain initiatives should be implemented across the supply chain (Sari, 2008).
Supply Chain Collaboration

Based on a 2002 research study, 600 responses from members (middle level managers) of American Production and Inventory Control Society, National Association of Purchasing Managers and Council of Logistic Management, evidence suggests that the scope of supply chain collaboration is limited (Fawcett et al. 2002).

Supply Chain Collaboration

True collaboration beyond first-tier is rare. Automotive action group observed that materials information sent to third and fourth tier suppliers often took four to six weeks arrive and, when it did arrive, it was often distorted (Fawcett et al, 2002).

Yet, 150 senior executives at Fortune 1,000 companies indicate supply chain collaboration is “very important (Cottrill, 2002).
Benefits of Supply Chain Collaboration

Based on a 2006 survey research study of 196 members of the Council of Logistics Management, the findings suggest that relationships exist between the use Supply Chain Management practices and improved organizational performance and between the use of Supply Chain Management practices and Improved Competitive Advantage.

Li et al. 2006

Benefits of Supply Chain Collaboration

Supply Chain Management practices in the 2006 study include:
- Strategic Supplier Partnerships
- Customer Relationships
- Level of information sharing
- Level of information quality
- Postponement

Li et al. 2006

Benefits of Supply Chain Collaboration

Specific organizational performance measures include:
- **Short term** - Increased productivity
  - Reduced inventory
- **Long term** - Market performance
  - Financial performance

Li et al. 2006
**Benefits of Supply Chain Collaboration**

Specific competitive advantage measures include:
- Competitive pricing
- Value to the customer
- Dependable deliveries
- Time to market

Li et al. 2006

**Supply Chain Collaboration**

Supply Chain Initiatives:
- Outsourcing
- Establish Modular Suppliers
- Postponement
- Point of Sale (POS)
- Electronic Data Interchange (EDI)
- Vendor Managed Inventory (VMI)

**Supply Chain Collaboration**

Supply Chain Initiatives:
- Continuous Replenishment Program (CRP)
- Collaborative Planning, Forecasting and Replenishment (CPFR)
- Enterprise Resource Planning (ERP)
- Radio Frequency Identification (RFID)
Outsourcing

Traditional Approach - Controlling (owning) all aspects of the business

Outsourcing – focus on core competencies

- Source non-core parts/functions and keep the parts/functions you do well.
- Identify organizations that can perform non-core parts/functions better than your company.
- Set up arrangements with those companies to produce the non-core parts/functions.

Not based solely on costs

Establish Modular Suppliers

With product lines involving large numbers of component parts – let the suppliers assume subassembly responsibilities for logical group of parts. For example, Hewlett Packard invites its sheet metal fabricators to load wiring and other components into the frames. This greatly reduces the many different parts from suppliers. Production cycle shrinks, while providing value-added strengthening of the supply base.

Schonberger, 2006

Postponement

The practice of moving forward one or more operations or activities (making, sourcing and delivering) to a much later point in the supply chain. Postponement is a systematic approach to designing and developing standard, configurable products that can be differentiated quickly and inexpensively once the customer demand is known (Li et al. 2006).

Implementing a postponement strategy involves fundamental changes to a company’s manufacturing processes and internal operations (Matthews & Syed, 2004)
Postponement

Effective use of postponement typically requires:
1. redesign of manufacturing processes – processes that have been in place for some time.
2. High degree of collaboration across the supply chain.
3. A restructuring of the product design process.

Matthews and Syed, 2004

Postponement

Based on a 2003 survey of 350 Supply Chain Managers – the major reasons for using postponement strategies:
1. Increased difficulty in forecasting consumer demand.
2. Increased demand for customized products.
3. High manufacturing costs.
4. Increased competition.

Matthews and Syed, 2004

Postponement

Based on a 2003 survey of 350 Supply Chain Managers – the major problems when implementing postponement strategies:
1. Too difficult to align organizationally.
2. Consumed too much of management time.
3. Too complex to implement.
4. Change was too difficult.

Matthews and Syed, 2004
Point of Sale

Point of sale (POS) refers to the point of sale. It can mean a retail shop, a checkout counter in a shop, or the location where a transaction occurs.

A POS terminal refers to the hardware and software associated with collecting data about sales. POS systems are most frequently used in retail establishments.

Evolution of Supply Chain Solutions

- Electronic Data Interchange
- Vendor-Managed Inventory
- Continuous Replenishment Program
- Collaborative Planning, Forecasting, & Replenishment

Adapted from Attaran & Attaran, 2007

Electronic Data Interchange

Electronic Data Interchange (EDI) refers to the structured transmission of data between organizations by electronic means. It is used to transfer electronic documents from one computer system to another - from one trading partner to another. Organizations might replace documents such as bills of lading, purchase orders, invoices, material releases, etc. with EDI messages.
Electronic Data Interchange

EDI is still the data format used by the vast majority of electronic commerce transactions in the world. For over two decades, electronic data interchange (EDI) has been one of the primary enabling technologies for conducting business-to-business (B2B) transactions. 55% of all North American large and mid-size companies report the use of an EDI network.

Narayanan et al. 2009

Electronic Data Interchange

The total value of EDI traditional and internet – grew from $1.99 trillion in 2003 to $2.68 trillion in 2007, with 45.9% of EDI commerce revenue attributable to Internet EDI.

A synthesis of the research on EDI suggests Lean is a driver of EDI adoption. Lean is predicated on the concept of more frequent deliveries from suppliers to point of use -> transaction frequency is a significant determinant of EDI adoption.

Narayanan et al. 2009

Vendor Managed Inventory

Vendor Managed Inventory (VMI) is where the supplier takes full responsibility for maintaining an agreed upon level of inventory at the buyer’s location.

In this practice, the replenishment decision for all retailers is centralized at the upstream distributor or manufacturer (Attaran & Attaran, 2007).
Vendor Managed Inventory

Typically, the buyer of the product typically agrees to provide certain product information to the supplier.

In contrast to buyers who often manage a broad portfolio of purchased items, suppliers are usually responsible for a more limited range of products of which they have more specific knowledge, therefore should be better in forecasting and managing the flow of their products through to the end customer.

Claassen et al. 2008

Vendor Managed Inventory

Effective implementation of VMI requires a cross-functional and inter-organizational approach. Accurate and timely demand information needs to be shared between the marketing and supply functions of the buyer as well as with the planning function of the supplier.

Only three of ten VMI implementations achieve the anticipated benefits.

Claassen et al. 2008

Vendor Managed Inventory

VMI existed in retailing before the growth of enabling technologies and is perhaps the most widely known system for managing supply chains (Attaran & Attaran, 2007). Vendor Managed Inventory (VMI) has been successfully applied by retailers and recently has spread to outside industries. Wal-Mart is one of the better examples of organizations that have applied VMI. This initiative is a logical extension of lean manufacturing. A third party logistics provider can also be involved.
Vendor Managed Inventory

Those areas considered important for developing success with VMI implementation:
- Openness
- Trust
- Honesty
- Mutual Interdependency
- Chemistry Between Partners
- Frequency of Interaction
- Commitment

Claessen et al. 2010

Continuous Replenishment Program

Continuous Replenishment Program (CRP) moves one step ahead of VMI and reveals the demand from retail stores. The inventory policy is then based on the sales forecast, built from historical demand data (Pramatari, 2007).

Pramatari, 2007

Continuous Replenishment Program

EDI data is transmitted, collected and used to develop forecasts for inventory demands, then creates replenishment orders and details. In CRP, the manufacturer or wholesaler replenishes a retailer regularly based on POS data (Attaran & Attaran, 2007).

Pramatari, 2007
Collaborative Planning, Forecasting and Replenishment (CPFR)

In 1995, Wal-Mart along with Warner-Lambert, Surgency, and software companies SAP and Manugistics, spearheaded an effort to define a process that would link customers demand with replenishment needs through the entire supply chain. The result was a set of business processes called collaborative planning, forecasting, and replenishment (CPFR) that help eliminate demand and supply uncertainty through improved communications between supply chain partners.

Attaran & Attaran, 2007

Collaborative Planning, Forecasting and Replenishment (CPFR)

Collaborative Planning, Forecasting and Replenishment is a step more advanced than VMI and CRP, addressing not only replenishment, but also joint demand forecasting and promotions planning, focusing on promotions and special-line items. CPFR is based on extended information sharing between retailer and supplier, including point of sales (POS) data, forecasts and promotion plans (Pramatari, 2007). CPFR is the third most widely used supply chain initiative (Attaran & Attaran, 2007).

CPFR and Stages of Collaboration

CPFR provides supply chain collaboration at four stages:
1. Planning – at this stage, the relationship between buyers and sellers is planned and updated. It leads to front-end agreement and joint business plan. Variances, whether plan-to-plan or plan-to-actual are also addressed.
2. Forecasting of Demand and Supply – at this stage, sales/order forecast is created, exceptions or discrepancies are identified and are resolved. The CPFR process improves forecast accuracies by having customers and suppliers participate in the sales/order forecast, tying the buyer and seller together so their goals are compatible.

Attaran & Attaran, 2007
CPFR and Stages of Collaboration

CPFR provides supply chain collaboration at four stages:

3. Execution – at this stage, the order is generated, shipments are prepared and delivered, products are received and stocked on retail shelves, sales transactions are recorded and payments are made.

4. Analysis – at this stage, monitor planning and execution activities for exceptional situations. If the discrepancy occurs, the two trading partners can get together and share insights and adjust plans to resolve such discrepancies.

Attaran & Attaran, 2007

Collaborative Planning, Forecasting and Replenishment (CPFR)

Case examples of CPFR success:
- Wal-Mart
- Heineken USA
- Dell Computer
- Herlitz AG
- Coca-Cola FEMSA
- Colgate-Palmolive
- Palm Inc.

Attaran & Attaran, 2007
Enterprise Resource Planning

Enterprise Resource Planning (ERP) is an extension of the MRP system. It integrates all functions through a common database and forces standard systems throughout the organization. It provides a web-enabled system with real-time information access and sharing. Consequently, it is used to coordinate decisions along the supply chain.

Enterprise Resource Planning

The Supply Chain Management (SCM), Customer Relationship Management (CRM), and Electronic Commerce (E-commerce) modules are the modules typically adopted for the supply chain activities. No single-wide standards exist for ERP systems.

Various studies indicate that 50-70% of all worldwide ERP system implementations in both developed and developing markets, face problems and fail to achieve their stated objectives. Even firms that achieved technically successful implementations are unable to garner the expected benefits from their ERP systems.
Radio Frequency Identification

Radio-frequency identification (RFID) involves the use of an object (typically referred to as an RFID tag) applied to or incorporated into a product, animal, or person for the purpose of identification and tracking using radio waves. Some tags can be read from several meters away and beyond the line of sight of the reader. Today, RFID may be used in enterprise supply chain management to improve the efficiency of inventory tracking and management.
Effective Supply Chain Collaboration

Based on a 2008 empirical study of 334 middle and senior level managers from the Institute of Supply Management (ISM), the Council of Supply Chain Management Professionals (CSCMP), and American Production and Inventory Control Society (APICS), the following were identified as the most important barriers to effective supply chain management:

- Inadequate information systems
- Lack of clear alliance guidelines
- Inconsistent operating goals
- Lack of shared risks and rewards
- Processes poorly costed
- Non-aligned measures
- Lack of willingness to share information
- Organizational boundaries

Barriers to Effective Supply Chain Collaboration

Overall, the members of the Logistics Directors Forum 2008 believe that the people issues are the most important barrier to effective supply chain collaboration.

The Directors also believe there is a need to establish a way of measuring the benefits and a system that allows for win-win benefits for all.
Bridges to Effective Supply Chain Collaboration

- Frequent communication
- A willingness to share information
- Use of cross-functional teams
- Share expertise with suppliers
- Common goals
- Supply base reduction
- Senior management interaction
- Cross functional processes

Fawcett et al. 2008

Supply Chain Strategy

Based on a survey of 2100 executives:
49% reported that their companies had no formal value chain strategy.

Among those companies that had formal value chain strategies, only 26% felt good about their strategy. Suggests that most companies have huge opportunities for improving their supply chain performance.

Attaran & Attaran, 2007