



Received June 16, 2007 / Accepted September 20, 2007

“DOMAIN OF SUPPLY CHAIN MANAGEMENT – A STATE OF ART”

Atul B. Borade

*Jawaharlal Darda Institute of Engineering and Technology,
Yavatmal (M.S), India.
atulborade@rediffmail.com.*

Satish V. Bansod

*Professor Ram Meghe Institute of Technology and Research,
Badnera (M.S), India.
satishbansod@rediffmail.com.*

Abstract:

A supply chain is a network of facilities and distribution channels that encompasses the procurement of materials, production, assembly and delivery of product or service to the customer. The management of the supply chain and the roles of various actors involved differ from industry to industry and company to company. As a result Supply Chain Management (SCM) has become a vital issue for manufacturers, professionals and researchers. It is felt that to manage the supply chain effectively entire structure of supply chain must be understood properly. This paper attempts to provide the reader a complete picture of supply chain management through a systematic literature review. It presents a state of art on SCM by systematically arranging main activities in supply chain. In addition the step-by-step approach for understanding the breadth and depth of Supply Chain is proposed which consequently explores the domain of SCM.

Key Words: Supply Chain, Supply chain activities, Supply chain management, Implementation strategy.

Introduction:

Organizations adopt numerous business improvement methodologies to improve the business performance. Researchers, Manufacturers advocates the manufacturing strategies like Quality Circles, Just In Time, Concurrent Engineering, Business Process Reengineering, Total Quality Management, and Six Sigma etc. according to the need of industry or the trend prevailing at the time for business performance improvement. These strategies surfaces and loose the shine in no time, but Supply chain management stands tall against all the odds and has become an integral part of corporate strategies. Manufacturers and researchers have noted a number of problems regarding supply chain activities in their research and practice (Sridharan et al., 2005). It is observed that usually either a system (Integrated approach) or a subcomponent in supply chain (Dis-Integrated approach) is focused and discussed in

the literature but fails to answer the rational (why, what, how) behind supply chain activities (Spens & Bask, 2002). This paper addresses these questions with the help of structured literature review, which not only helps to understand the management of supply chain but also delimits research scope of SCM.

Review of Literature:

Adoption of Supply chain management practices in industries has steadily increased since the 1980s. A number of definitions are proposed and the concept is discussed from many perspectives. However Cousins et al. (2006); Sachan and Datta (2005); Storey et al. (2006) provided excellent review on supply chain management literature. These papers define the concept, principals, nature, and development of SCM and indicate that there is an intense research being conducted around the world in this field.

They critically assessed developments in the theory and practice of supply management and through such an assessment identified barriers and enablers. Authors found gaps in theory and practice and explored future research areas.

Studies on supply chain management suggest that the scope of business processes being coordinated across supply chains is broad. Mejza and Wisner (2001) determined the scope of processes that are being integrated across organizational borders and indicated that a large number of companies that practice supply chain management are attempting to integrate logistics, marketing, and operations-oriented processes across supply chains. Gunasekaran and McGaughey (2003) extended the scope of SCM beyond material management, partnership, information technology to the Total Quality Management areas like management commitment, organizational structure, training and behavioral issues. As firms' survival lies on integration, a good understanding of the integration process is a key aspect in SCM. Stonebraker and Liao (2006); Yih Wu et al. (2004) studied how to integrate the supply chain management business process. It is concluded that the level of investments to supply chain partners, the degree of dependence between supply chain partners, and the level of product salability of manufacturer would enhance commitment and, consequently, the integration of the SCM business process. Håkansson and Persson (2004) provided a theoretical framework and proposed the theoretical as well as empirical reasons for enhancing the underlying logic of process integration in supply chain management to capture pooled and reciprocal interdependencies. Mouritsen et al. (2003) discussed that basic hypothesis “the more integration (more wider the scope)– the better the management of the chain” is not always true and proved that it depends very much on the “environment” of the supply chain and the power relations between the participants in the supply chain.

Varma et al. (2006); Cigolini et al. (2004) discussed strategy formulation, identified decision-making areas for improving material flow, and finally performance evaluation in order to determine how well the supply chain initiative has been implemented. Authors proposed a set of management techniques and tools to analyze successful SCM strategies. As traditional supply chain too often, is a sequence of weakly connected activities both within and outside the organization and leads to many misalignments. Piplani and Fu (2005) presented a coordination framework, called ASCEND, to align the inventory decisions in decentralized supply chains. The framework was based on multi-agent technology, coordination theory, and optimization technology.

It is also observed that research is not limited to hypothesis testing and data analysis, but more advanced techniques like simulation, Artificial Neural Network, and Fuzzy logic are also used for optimization and decision

making in SCM. Chan et al. (2002) proposed a simulation approach for measuring supply chain performance, which incorporates order release theory. The importance of order release is first examined and its applicability to monitor the performance of the supply chain is proposed. Using the simulation model, a new order release mechanism was developed which improved the supply chain performance. Koh and Tan (2006) used the principles of fuzzy logic for analyzing and monitoring performance of suppliers based on the criteria of product quality and delivery time where as Chiu and Lin (2004) showed how the concepts of collaborative agents and artificial neural networks (ANNs) can work together to enable collaborative supply chain planning (SCP).

It appears from literature review that researchers have studied supply chain management from a system perspective, or the systemic natures of interactions between the participants of supply chain are observed. Although numerous studies views SCM from different perspectives, this paper gives the better understanding of supply chain activities and its mapping by answering the rational behind SCM.

Understanding Supply Chain Management:

Concept of Supply Chain Management.

SCM is management of material, money, men, and information within and across the supply chain to maximize customer satisfaction and to get an edge over competitors. Customers want products at the right place and at the right time. For this, there should be an excellent synchronization between the manufacturer and the customers. This was the origin of the “Barter system” as we all know. As things started becoming complicated, where one person had to reach many individuals for his needs, one of the individuals started management of gathering the products from different people and supplying to those who are in need and thus fulfilling his needs in return. This was the revolutionized form of the Barter system and today it is known as the supply chain management (Chopra & Meindl, 2001).

Researchers found that the lack of commonly accepted definition of supply chain management and the problems associated with supply chain activities makes the understanding of supply chain management difficult. Let us try to understand what is SCM. Supply chain management is an enormous topic covering multiple disciplines deploying many quantitative and qualitative tools (Johnson & Pyke, 1999). There are numerous definitions of SCM; few definitions discussed here would give an idea in a nutshell. For example, Simchi-Levi et al. (2003) defines Supply chain management as “*a set of approaches utilized to efficiently integrate suppliers, manufacturers,*

warehouses and stores, so that merchandise is produced and distributed at the right quantities, to the right locations, and at the right time, in order to minimize system wide costs while satisfying service level requirements". (p. 1). Author emphasizes the activities undertaken by the various actors involved in the supply chain and sets the performance indicators as the economic production and distribution of goods. Chopra and Meindl (2001) urges "the processes which occur before manufacturing or production into a deliverable product or service, typically processes dedicated to getting raw materials from suppliers; and the processes which occur after manufacturing or production dedicated to getting goods and services to customers." (p. 3). Thus the processes before and after the production along with material and information flow are pinpointed which would help organization to achieve maximum profit. Global Supply Chain Forum defines Supply Chain Management "as the integration of key business processes from end user through original suppliers, that provides products, services, and information that add value for customers and other stakeholders" (Lambert et al., 1998). This definition aptly includes the information flow for value addition instead of emphasizing the economic aspect only like previous definitions. The process is considered as the management of the entire value-added chain, i.e. from the supplier to manufacturer, to the retailer and the finally customers. Koch (2006) quotes "Supply chain management is the combination of art and science that goes into improving the way company delivers products to customers." The dent is not only tools and techniques used to tackle the problem of purchase, production and distribution but also skill (art) required for running business effectively. According to Arunachalam Raghu (2003) "Supply chain management is concerned with planning and coordinating the activities of organizations across the supply chain, from raw material procurement to finished goods delivery".

Thus it clear that deriving the specific objectives and scope of SCM is a formidable task since it depends on numerous factors.

Need To Manage The Supply Chain:

The next important issue is why the firms should consciously manage the supply chain. Supply chain involves the cost to convey the information, produce components, store them, transport them, and transfer funds and so on. The total cost of supply chain tends to increase due to many parameters like huge capital cost required for running global businesses, mounting real estate costs and fright charges (Koch, 2006). However the perfect planning in SCM regarding material arrival, production schedule and distribution not only reduces the inventory and inventory cost but also reduces the wasted time and energy (Verma et al., 2006). Economic research literature has pointed out that there are linkages between inventory investment and

business cycle fluctuation. Supply chain management drastically alters inventory investment across a range of industries, and helps to tackle economic fluctuations (Heng et al., 2005).

In global supply chain manufacturers are graphically dispersed around the world. Each company is involved in a wide variety of supply chain activities such as order fulfillment, international procurement, acquisition of information technology, manufacturing, faster and reliable delivery of products and customer service (McIvor, 2000). SCM includes extensive research and data analysis to perform above activities efficiently. It is also observed that whole supply network could improve its ability to meet expectation of consumers in terms of quality through co-management of quality and supply chain practices (Romano & Vinelli, 2001). Thus by using supply chain management principals, the company will be able to reduce product defects and to improve relationships within supply chain (Sahay et al., 2006). In today's ERP controlled uncertain manufacturing environments SCM ensures higher availability of product to avoid Lost sales / Stock outages. It also stresses the importance of the efficient consumer response process to achieve both customer satisfaction and business efficiency (Romano & Vinelli, 2001).

Issues To Ponder In Supply Chain:

It is found that SCM encompasses planning, manufacturing and operations management necessary to bring a product to the market place, from the sourcing of materials to the delivery of the completed product. This section would provide insights on the aspects and the issues that are to be managed in supply chain.

Information Technology and Information Management:

The advent of the Internet and electronic communication has enabled companies to be more responsive to their customers than ever. Sanchez and Perez (2003); Tarn et al. (2002); Wieder et al. (2006) examined functions, current developments and the rationale for IT integration by analyzing the problems of enterprise resource planning (ERP), electronic data interchange (EDI) and presented the solutions of SCM. Authors provided insights into the adoption of systems and the impacts on organizational performance. There were no significant performance differences found between ERP adopters and non-adopters, either at the business process level, or at the overall firm level. Although it was confirmed that the rich experience of firms with ERPs, tends to deliver higher overall performance, but no evidence was found of a similar effect on supply chain performance. On the contrary EDI adopters perceived more operational benefits, more external pressure and mutual understanding, and fewer technical and organizational difficulties than non-adopters of EDI. Shore

and Venkatachalam (2003) assessed information sharing capability of potential supply chain partners. Fuzzy logic, a subset of artificial intelligence, together with analytical hierarchy process was used to model the process and rank potential suppliers. The methodology implicitly aids supply chain design decisions since it explicitly handles vague, ambiguous, and imprecise data. Kian Ng et al. (2003) described the development of a simulation workbench for modeling and analyzing multi-echelon supply chains. The workbench facilitates study of inventory and forecasting policies practiced by the echelons, and models different information exchange mechanisms. An experiment was conducted, to test the workbench and its capabilities and it was confirmed that the workbench is a useful tool for gaining valuable insights into information exchange in a particular supply chain.

Information sharing practices such as vendor-managed inventory (VMI) give manufacturers access to more accurate demand information, e.g. customer sales data, than before. Småros et al. (2003) used discrete-event simulation to examine how a manufacturer can combine traditional order data available from non-VMI customers with sales data available from VMI customers in its production and inventory control and what impact this has on the manufacturer's operational efficiency. The key finding was that even for products with stable demand a partial improvement of demand visibility could improve production and inventory control efficiency. Other finding was that the value of visibility greatly depends on the target products' replenishment frequencies and the production planning cycle employed by the manufacturer.

Knowledge Management:

Global competition and accelerating technological changes, especially in information communication and Internet technologies makes competition knowledge-based thereby affecting supply chain management across firms (Lang, 2001). A stronger emphasis on knowledge management as part of business strategy may help supply managers to manage uncertainty better. Fan et al. (2000); Warkentin et al. (2001) proposed a framework of knowledge management and "e-knowledge networks" in inter-organizational systems to support organizational collaboration. It is observed that establishing internal knowledge management systems for organization creates opportunities to minimize knowledge isolation in functional departments and creates a greater base for tacit learning to be leveraged. On the other hand external knowledge management systems bring value chain members closer together and add value to the product (i.e. increased quality, customer perceptions of brand platforms) throughout the value chain. Koh and Tan (2006) found that only knowledge management is many times inadequate for managing a supply network in uncertain environment hence a new approach – called the "intelligence handbook" was

proposed to discover operational intelligence in order to map knowledge in a supply network with uncertainty. Desouza et al. (2003) linked the impact of organizational structure in knowledge transfer and utilization among the different participating functions in the perspective of systems theory. Authors then exploits the rational behind an effective process of knowledge movement in any organization, and the probable factors that influence such movements.

Customer - Supplier Relationship Management:

Customer satisfaction is absolute for staying abreast in competitive environment that can be achieved only by quickly responding to customer needs. Efficient consumer response (ECR) is a supply chain management strategy that attempts to address the inefficiencies in the supply chain. Hoffman and Mehra (2000); Harries et al. (1999); Sparks and Wagner (2003) discussed efficient consumer response (ECR) as a supply chain strategy by analyzing the adoption of ECR strategy in some industries. Furthermore, a management action plan is presented for future adoption of ECR strategy by similar business operations. Authors recommended flexible supply chain by involving change in layouts, establishing faster set-ups and by developing partnership with vendors for quicker response.

The advent of the Internet allows electronic communication with suppliers regarding matters of stock availability, ordering and delivery without the associated costs of Electronic Data Interchange. As a result organizations can deal with a larger network of suppliers. Power (2004) examined the relationship between suppliers and manufacturers, and the effectiveness of business to business (B2B) e-commerce implementations. The results indicated that there is a clear link established between effective management of human resources and effective implementation of B2B e-commerce. Jonsson and Zineldin (2003) proposed conceptual model including behavioral dimensions of supplier-dealer relationships and presented hypotheses about how to achieve satisfactory inter-organizational relationships. It is concluded that long-term relationships between customer and supplier can lead to higher satisfaction. Lambert and Pohlen (2001) provided a framework for developing supply chain metrics that translates performance into shareholder value. The framework emphasized on managing the interface between customer relationship management and supplier relationship management at each link in the supply chain.

Supply chain Design:

Manufacturing firm's supply chain design is based on effective integration. Although supply chain management mainly concentrates on the manufacturing function, Braganza (2002) and Power (2005) examined different perspectives on integration and suggested that integration of several functions at different organizational levels achieve

above average financial and performance results. It is observed that current static approaches and theoretical models are ineffective in considering all variables and constraints for designing supply chain. These often require a lot of computing time and present poor flexibility in terms of model changes as a result a large number of firms have reconfigured their supply chains. Reconfiguration is to be done through the reduction, centralization and re-location of plants and distribution centers, design of new distribution systems, and reduction of the supplier base. Lemoine and Larsen (2004) analyzed implications of such reconfiguration for freight transport showing how changes in logistic structures and decisions could affect the supply chain decision.

The manufacturing firms has witnessed lean production paradigm positively, and there is much evidence to suggest that level scheduling combined with the elimination of waste has successfully delivered a wide range of products. This has led to the emergence of the agile paradigm characterized by “quick response” and similar schemes. Manson- Jones et al. (2000) demonstrated how the “lean” and “agile” paradigms might be integrated. They designed a total performance metric and developed a route map for integration of lean production and agile supply in the total chain. The supply chain dynamics and associated control problems calls for reengineering the supply chain. In practice many organizations have adopted business process-reengineering (BPR) initiatives but the results are disappointing. Lalwani et al. (2006) suggested that one of the reasons for this might be the difficulty of grasping the full dynamic complexity of the processes and systems encountered. Authors proposed that current developments in systems thinking and continuous system simulation, when applied within the context of an operations management framework, may offer the good design of SC and improved success ratios in BPR projects.

Logistics and Distribution management:

Many years practitioners and professionals were confused between “logistics” and “supply chain management”, the usage of each term varied according to the industry. Lummus et al. (2001) examined the historical definitions of both terms, and proposed a hierarchy for the relationship between logistics and supply chain management. In context of changing environments resources are dispersed world wide, and the distances between production facilities has increased. It is felt that effective logistics planning with respect to warehouse location and choice of vehicle routings will guarantee organizations to respond quickly in harsh business ambiance. Gimenez and Vutura (2005) studied the internal and external integration influence of logistics on other functions of supply chain management. The study revealed that integration in the logistics-marketing interface does not lead to reductions in costs, stock-outs and lead-times. The integration achieved in the logistics-

production interface does improve these performance measures, if there is no external integration; but the external collaboration among supply chain members does always contribute in improving firms’ logistical performance. A product return is another worry for the supply chain managers. Srivastava and Srivastava (2006); Meade and Sarkis (2002) presented a framework to manage product returns in reverse logistics by focusing on product ownership data, average life cycle of products, past sales, forecasted demand and likely impact of environmental policy measures. It is observed that reverse logistics is one of the toughest supply chain challenges.

Once the product has been manufactured it is very important that there should be an adequate structure to distribute it to the customers. Neves et al. (2001); Ma and Davidrajuh (2005) proposed distribution channels planning model. Authors explored the use of an iterative approach for designing distribution chain in an agile virtual environment; and proved that quick adaptation to changing market situation and automation of supply chain management processes are essential. First, the strategic model (including number of distributors, location of distributors) is determined. Then, based on the output of the strategic model, the tactical model (i.e. the inventory planning at each node, and vehicle routing between different nodes of the chain) is determined. After determining the tactical model, the operation-related parameters from the tactical model are input into the strategic model again, and the configuration of distribution chain is re-optimized.

Outsourcing & Global Issues

Shortened product life cycles and increasing global competition has tempted traditional manufacturers to contemplate on their competencies, such as product design and development, and a decision to outsource. Although the decision to outsource can have both positive and adverse effects on key areas of the manufacturing supply chain, one positive effect is that the manufacturer’s supply chain agility is increased (Mason et al., 2002). The logistics costs often comprise a large portion of the total global sourcing cost, thereby determining the effectiveness of procurement strategy. Although the literature on the strategic aspect of global sourcing is large, detailed studies on this procurement strategy from a process perspective are limited. Jennings (2002) and Zeng (2003) projected strategic benefits and problems relating to the outsourcing decision. These include issues of cost, quality, flexibility, strategic focus, and diversification, the potential loss of critical skills and knowledge, and appropriation of final product value. A model was developed, structuring the contextual factors: capability, cost, technology, supply and product market conditions, to enable a consideration of the outsourcing decision. Buxey (2005) and Svensson (2001) explored the linkage between firms' outsourcing activities

and the occurrence of supply chain disruptions. It was based upon a two-phase process utilizing methodological triangulation. Phase one applied qualitative methods that explored the overall environment of outsourcing and disruptions in supply chains while phase two applied quantitative methods to test the findings from phase one in a wider context.

Blowfield (2005) discussed the experience of employing global social and environmental standards, in terms of a global ethic. It is concluded that, with certain important caveats, current approaches to managing the social and environmental dimensions of global supply chains provide a crude means of tackling societal expectations and this can mislead managers to tackle the problem in hand.

Partnership Issues:

As global markets grow increasingly efficient, competition no longer takes place between individual businesses, but between entire value chains. Therefore executives are developing supply chain partnerships/collaboration in an attempt to reduce costs, improve service and to gain competitive advantage. Collaboration requires individual participants to adopt simplified, standardized solutions based on common architectures and data models. Horvath (2001) proposed that Collaboration through intelligent e-business networks would provide the competitive edge to all the participants in a value chain to prevail and grow. It is found that collaborative partnerships can be achieved both via trust and through electronically mediated exchange. Myhr and Spekman (2005) investigated how supply-chain partners can achieve collaboration under varying circumstances (transactional types) by developing trust-based social foundations and by utilizing electronically mediated exchange. Results also indicated that electronically mediated exchange more readily enhances collaboration in exchange relationships involving standardized products, while trust plays a larger role when customized products are being exchanged.

Barratt and Oliveira (2001) proposed collaborative planning, forecasting and replenishment (CPFR) as a strategy to overcome barriers through joint planning, joint decision-making and the development of a clearer understanding of the supply chain replenishment process to achieve some of the promised benefits of actual supply chain integration. Frankel et al. (2002) showed that one of the most common usages of partnerships is in the provision of transport and distribution services. Authors recommended that rather than devoting effort and resources to build an in-house supply chain it can often be much more cost-effective to form a partnership with a shipping company, and allow them to perform the job of distribution at a lower cost than the enterprise could manage itself. It is concluded that although change has been slower than desired, many firms have collaborated effectively and

achieved significant results through coordinated supply chain activities

Performance Measurement:

By continuously analyzing the performance of the enterprise over a range of functions managers identify areas of weakness and opportunities for improvement. Tracey and Tan (2001) empirically tested the impact of supply-chain management (SCM) capabilities on business performance so as to determine to what degree customer-oriented SCM influence competitive position and organizational performance. It was concluded that strategic development of SCM capabilities such as efficient inbound and outbound transportation, warehousing, inventory control, production support, packaging, purchasing, order processing, and information dissemination enables a manufacturing firm to identify key performance measures. Agarwal and Shankar (2002) proposed an analytic network process (ANP)-based model. It provided an effective framework for analyzing the alternatives affecting supply chain performance. It also provides the decision methodology to prioritize these alternatives, so that supply chain performance can be improved. Chan and Qi (2003); Jain et al. (2004) evaluated the performance by applying evolutionary fuzzy system to the attributes associated with the suppliers and manufacturing units. A process-based systematic perspective was employed to build an effective model to measure the holistic performance of complex supply chains. Fuzzy set theory was introduced to address the real situation in judgment and evaluation processes. Further author investigated how the dynamics of supply chain (SC) relationships impact on manufacturing performance. Usually in SCM the emphasis is on performance measures dealing with suppliers, delivery performance, customer-service, and inventory and logistics costs. Fynes et al. (2005), Gunasekaran et al. (2001) developed a conceptual framework to link up SC relationship dynamics and manufacturing performance and found out the less evidence of SC relationship dynamics on manufacturing performance.

Environmental issues:

Lin (2001) et al.; Stonebraker and Liao (2006) discussed several analytic models currently evaluated in environmentally conscious business practices. Author contended that the process of environmentally conscious business practice should be studied as a multi-dimensional issue. These dimensions include an analytical dimension of strategy and decision procedure, a behavioral dimension addressing corporate culture and an organizational dimension concerned with regulatory environment and supply chain management. Authors posit that, for efficiency and success, a strategic fit must exist between environmental, strategic and operations variables. Subsequently, the stage of product/process life cycle and

environmental variables such as complexity and munificence are examined in detail and are taken as a basis for the theoretical model and propositions. Simpson and Power (2005) presented a conceptual framework to investigate supplier relations, lean manufacturing, environmental management practices; and their relationship to one another. It is found that efforts to improve a supplier's environmental management practice raise critical issues of transaction costs and efficacy of approach for the buyer.

In the rapidly changing circumstances; Year Two Thousand (Y2K) problem was unique to some extent, but it was only one of many potential environmental changes that organizations have to respond. Dewhurst et al. (2000) studied Y2K event and found that this event could provide useful information for future significant environmental changes; changes in trading and market environments; changes in employment law and assessed the impact on supply chain. In order to understand and reduce those impacts, it is recommended that an environmental bias is to be introduced into the decision making process which would allow more environmentally conscious decisions to be made.

Managing Supply Chain

For successful SCM implementation managers must understand the issues concerned with planning the supply chain. While developing supply chain they will have to analyze the critical factors for external and integration. The totality of SCM would be incomplete without the distribution and return management of goods. In this section highlights necessary stages required for adoption and implementation of SCM practice. These six stages are: Plan, Analyze, Develop, Integrate, Deliver, and Return.

Stages:

Plan: The first stage in supply chain management is known as a Plan. A plan or strategy must be developed to address how a given product or service will meet the needs of the customers (See:<http://www.wisegeek.com>). A significant portion of the strategy should focus on planning a profitable supply chain. Sadler and Hines (2002) investigated how a team of managers from the companies in a supply chain can help to formulate strategic plans for operating the whole chain, to benefit each company and to benefit the whole chain. Varma et al. (2006) suggested a broad framework for implementing supply chain management (SCM) in a firm. This consists of strategy formulation, identification of areas for improving material flow, and finally performance evaluation in order to determine how well the supply chain initiative has been implemented. The guideline for SCM implementation is

recommended. Kaipia et al. (2006) presented a framework for supply chain decision-making. A data analysis of the quality of plans for demand and supply was generated in decision-making point by collecting planning and actual data of two products. The results show that planning accuracy varies between the parties in the supply chain. The Supply Chain Operations Reference (SCOR) model, developed by the Supply Chain Council, is a strategic planning tool that allows managers to simplify the complexity of supply chain management. It is firmly rooted in industrial practices and is poised to become an industrial standard that enables next-generation supply chain management. Huan et al. (2004) introduced the SCOR model, analyzed its strength and weakness, and discussed how it can be used to assist managers for strategic decision-making.

Analyze: The second stage would be to analyze the various factors involved in supply chain. The analysis would be useful for the practicing managers in developing strategies for their supply chains. Today, organizations global supply chains deals with large amount of uncertainty. Prater et al (2001); Koh and Gunasekaran (2006) provided a new approach for understanding the different types of uncertainties that can impact supply chains and information systems. The approach presented allows researchers and practitioners to analyze the exact problems encountered in the management of supply chains and the tools that are needed to address these problems. Zsidisin et al. (2004) explored, analyzed, and derived common themes on supply risk assessment techniques. The research indicated that purchasing organizations could assess supply risk with techniques that focus on addressing supplier quality issues, improving supplier processes, and reducing the likelihood of supply disruptions. Emiliani (2003) analyzed the source of conflict between buyers and sellers as it relates to the price of goods purchased for use in production. Authors argued that conflict between buyers and sellers is an inevitable outcome when buyers make decisions principally centered upon the literal interpretation of management's role as agents of the board whose primary responsibility is to maximize shareholder value. Lockamy and Smith (2000) analyzed use of target costing as a means to improve the management of supply chains. Customer requirements and supply chain relationships are identified as key criteria in SCM for selecting the most appropriate method of target costing for supply chains. Price-based, value-based, and activity-based cost management approaches to target costing are discussed, and recommendations for their use based upon customer requirements and supply chain relationships are offered.

Develop: This phase not only identify reliable suppliers but also includes development of mutual trust, information system and cordial relations between the various partners

involved in supply chain (See:<http://www.wisegeek.com>). In this stage SCM concepts are applied for developing methods of payments, shipping, delivery to provide better customer services. Claro et al. (2006) discussed the value of trust and the effects of transaction specific investments for the relative degree of collaborative joint efforts, and also to assess the moderating effect of the information network on such joint efforts. It is found that although information network does not moderate the relation between trust and joint efforts, there is a significant moderating effect of the network on the relation between transaction specific investments and joint effort. The results suggested that buyers temper their specific investments to the degree of joint effort according to the information that is obtained in the network. It has been concluded that supply chain collaboration is difficult to implement; when there is over-reliance on technology, and fundamentally a lack of trust between trading partners. Emiliani (2003) examined the ability of online auctions and its effects on relationships between suppliers and buyers. It is concluded that buyers will have to consider relationships with their own company, existing suppliers and new suppliers, for building trust and competing objectives. Author shows how an auction changes the dynamics of these relationships, outlined the positives results obtained by online auctions, and highlighted some possible abuses of the system.

Integrate: The next stage in supply chain management is to integrate. SCM needs integration of all activities like sourcing, procurement, production scheduling, order processing, inventory management, transportation, manufacturing, warehousing, and customer services. Research suggests that integration of several functions at different organizational levels could give above average financial and performance results. However, Braganza (2002) found that enterprise integration is associated with many problems; at the root of these is a fundamental assumption: that all enterprise integration initiatives are equally important. He proved that enterprise initiatives differ by their purpose; and proposed a framework for typifying enterprise integration initiatives based on the capabilities of organization. Zailani and Rajagopal (2005) presented a model of an integrated business process, which highlights the importance of communication between processes and between partners in the supply chain. It is urged that though there is a wide acceptance of the strategic importance of integrating operations with suppliers and customers in the supply chain, many questions remain unanswered for supply chain strategies. Authors sought connections between supplier and customer integration, and found out how these strategies actually differ and affect performance of the companies

Deliver: Then, at the logistics phase, customer orders are received and delivery of the goods is planned

(See:<http://www.wisegeek.com>). This stage of supply chain management stage is aptly named Deliver. The distribution function in a supply chain is an important internal service function for any firm, and has been increasingly recognized as playing a strategic role in achieving competitive advantage. For developing distribution channels, companies will decentralize their final manufacturing into their distribution centers. Johnson and Anderson (2000) suggested both the repositioning of final manufacturing into the distribution channel and the move towards customization-on-order are related to the implementation of postponed manufacturing. Results suggest that the implementation of postponed manufacturing require not only the reconfiguration of the logistics systems, but also that of other operations in the supply chain, thus creating a cross-functional effect.

Radio frequency identification (RFID) is currently used in many industries in transportation, distribution, manufacturing, processing and security. Smith (2005) suggested that such technologies with the appropriate IT infrastructure could help major distributors, manufacturers; to deal complex and global supply chains. Because of cost, or security, or safety, or because parts are subject to corrosion, or food/medicine is subject to quality degradation, or products and product shipments must be traced and identified in a non-contact, wireless fashion is used in computer network. All of these requirements point to an automated, wireless-readable sensory-based identification method, and network, that offers more functionality and is significantly “smarter” than the well known bar code or the unified product code. Kärkkäinen and Holstrom (2002) analyzed the opportunities of wireless product identification technology in transforming supply chain management. A new concept of item level supply chain management and enabling steps to achieve the benefits are proposed. Innovative companies already use wireless product identification with great benefits in specific functional areas, e.g. manufacturing and warehousing. It is observed that the biggest potential is in item level supply chain management.

Return: The final stage of supply chain management is called Return (See:<http://www.wisegeek.com>). Returns management is the supply chain management process by which problems associated with returns, reverse logistics, gate keeping, are managed within the firm and across key members of the supply chain. The correct implementation of this process enables management not only to manage the reverse product flow efficiently, but also to identify opportunities to reduce unwanted returns and to control reusable assets such as containers. Rogers et al. (2002); Mukhopadhyay and Setoputro (2004) developed a profit-maximization model to obtain optimal policies for price and the return policy in terms of certain market reaction

parameters. It obtains a number of managerial guidelines for using marketing and operational strategy variables to influence the reaction parameters so as to obtain the maximum benefit from the market. Furthermore author emphasized the need to focus on the capability of human resources, the pricing of activities rather than products, and the use of information on consumer behavior.

Remanufacturing of used products is a innovative way in return management from economic and environmental point of view. Inderfurth (2005) studied a product recovery system where a manufacturer of original products is engaged in remanufacturing used products taken back from its customers, in the context of extended product responsibility. Moreover investigated to what extent profit orientation in product recovery management will stimulate an environmentally conscious behavior in manufacturers

Discussion and Conclusion:

Organizations have multiple objectives like enhanced competitiveness, better customer service and increased profitability etc. To seek these objectives organizations employ various defensive as well as offensive business performance improvement approaches. Often these approaches focus on any one operational area of organization. But the approach we have discussed (SCM) covers all functional areas of organization. It is the network of customers, suppliers, manufacturers, and distributors concentrating the flows of material, information, and finance through physical and human resources. Due to globalization organizations cannot work as standalone units. There is a continuous need to interact with supply chain partners to achieve the basic objective of organization. SCM requires concerted action of all the participants therefore adoption and implementation cannot be as straightforward as other approaches. Researchers and practitioners have developed a sustainable body of knowledge by deploying various qualitative and quantitative tools and techniques. It is observed that organizations have unique products, operations, culture; and have a different level of compatibility & adaptability. Therefore there cannot be one fix solution for all organizations. Depending upon corporate strategy organizations will have to develop a suitable supply chain management strategy .It would be a formidable task for managers if they do not understand the theoretical foundations and practical implications of SCM.

In this paper we have suggested that managers must probe why to manage, what to manage and how to manage the supply chain. We discussed the concept of supply chain management along with the need of SCM from organization point of view. This provides deeper insights for those managers investigating the concept of supply chain management .In order to explore the domain of supply chain management we have argued that one must examine the nature, interrelations and dependency among

business operations .We interrogated the theory and research practice to find what are the various supply chain activities. This through analysis of activities sheds light on the potential of supply chain management. Next big challenge for organizations is to make a suitable roadmap for adoption and implementation .We have suggested a six-step approach to meet this challenge. This step-by-step assessment of business operations would certainly assist organizations to completely understand the concept of supply chain management. Sooner or later all organizations would adopt SCM; therefore we recommend that managers should examine the domain of SCM to achieve business excellence.

Current trends like outsourcing, information technology adoption and third party logistics presents an opportunity for development of SCM. It is felt that in future all organizations will have to adopt partnership information sharing initiative with suppliers. Therefore establishment of mutual trust within supply chain to share the vital information for effective SCM practice; and development of suitable mathematical model for the same would be the greatest challenge for researchers and practitioners.

Acknowledgement: Authors would like to thank the reviewers and editorial team of JTIM for improving the earlier versions of this paper. Authors would also like to extend thanks to Prof. Nitin Ingole, Prof Ram Meghe Institute of Research and Technology .Badnera, India, for his continuous guidance and help.

About Authors:

Atul Borade is working as Senior Lecturer in Mechanical Engineering Dept. at Jawaharlal Darda Institute Of Engineering and Technology. Yavatmal. (M.S) India. He is a Ph D candidate at Amravati University. India. His areas of interest are Ergonomics, Production Management and Supply Chain Management. He can be reached at atulborade@rediffmail.com.

Prof. Satish Bansod is working as a Professor in Mechanical Engineering Department at Professor Ram Meghe Institute of Research and Technology. He has published many papers in International Conferences and Journals. His research areas are. Ergonomics, Production Management and Supply Chain Management .He can be reached at satishbansod@rediffmail.com.

References:

- Agarwal,A., Shankar,R., 2002. Analyzing alternatives for improvement in supply chain performance .*Work Study*, 51 (1), pp.32-37.
- Arunachalam,R., Eriksson,J., Finne,N., Janson,S., Sadeh,N., 2003. The TAC Supply Chain Management Game.).Available at. <http://www.sies.se/tac/TAC03spec.pdf>. Assesed on [21.9.06]
- Barratt,M., Oliveira,A., 2001. Exploring the experiences of collaborative planning initiatives. *International Journal of Physical Distribution & Logistics Management*, 31 (4), pp.266 – 289.
- Blowfield,M .E. 2005.Going global: how to identify and manage societal expectations in supply chains and the consequences of failure .*Corporate Governance*, 5 (3), pp.119 – 128.
- Braganza, A., 2002. Enterprise integration: creating competitive capabilities. *Integrated Manufacturing Systems*, 13 (8), pp. 562 – 572.
- Buxey,G., 2005. Globalisation and manufacturing strategy in the TCF industry. *International Journal of Operations & Production Management*, 25 (2), pp.100- 113.
- Chan F. T.S, Nelson K.H. Tang, H.C.W Lau, R.W.L. Ip., 2002. A simulation approach in supply chain management. *Integrated Manufacturing Systems*, 13 (2), pp.117 –122.
- Chan F. T.S, H.J. Qi., 2003. An innovative performance measurement method for supply chain management . *Supply Chain Management: An International Journal*, 8 (3), pp.209 – 223.
- Claro,D.P.,Priscila Borin de Oliveira Claro, Hagelaar,G., 2006. Coordinating collaborative joint efforts with suppliers: the effects of trust, transaction specific investment and information network in the Dutch flower industry. *Supply Chain management: An International Journal*, 11 (3), pp.216 – 224.
- Chiu, M., Lin,G., 2004. Collaborative supply chain planning using the artificial neural network approach. *Journal of Manufacturing Technology Management*, 15 (8),pp.787 – 796.
- Chopra,S., Meindl.P., 2001.*Supply Chain management .Strategy, Planning and Operation* .Pearson Education Asia.
- Cigolini, R., Cozzi, M., Perona, M., 2004 .A new framework for supply chain management: Conceptual model and empirical test . *International Journal of Operations & Production Management*, 24 (1), pp.7 – 41.
- Cousins,P.D., Lawson,B., Squire,B., 2006 . Supply chain management: theory and practice – the emergence of an academic discipline. *International Journal of Operations & Production Management*, 26 (7), pp.697 – 702.
- Desouza,K.C., Chattaraj,A., Kraft,G., 2003 .Supply chain perspectives to knowledge management: research propositions . *Journal of Knowledge Management*, 7 (3), pp.129-138.
- Dewhurst,D., Spring,M., Arkle,N., 2000. Environmental change and supply chain management: a multi-case study exploration of the impact of Y2000. *Supply Chain Management: An International Journal*, 5 (5), pp.245 – 261.
- Emiliani, M.L., 2003 . The inevitability of conflict between buyers and sellers. *Supply Chain Management: An International Journal*,8 (2), pp.107 – 115.
- Fan,I, Russell,S., Lunn,R., 2000. Supplier knowledge exchange in aerospace product engineering. *Aircraft Engineering and Aerospace Technology*; 72 (1),pp.14 – 17.
- Frankel,R., Goldsby,T.J., Whipple,J.M., 2002.Grocery Industry Collaboration in the wake of ECR.*The International Journal of Logistics Management*, 13 (1), pp.57 – 72.
- Fynes,B., Voss,C., Búrca,S.D., 2005.The impact of supply chain relationship dynamics on manufacturing performance. *International Journal of Operations & Production Management*, 25 (1), pp.6 – 19.
- Gimenez,C., Ventura,E., 2005 .Logistics-production, logistics-marketing and external integration: Their impact on performance. *International Journal of Operations & Production Management*, 25 (1), pp.20 – 38.
- Gunasekaran, A.,McGaughey,R.E., 2003. TQM is supply chain management. *The TQM Magazine*, 15 (6), pp.361 – 363.
- Gunasekaran, A., Patel, C., Tirtiroglu ,E., 2001. Performance measures and metrics in a supply chain environment .*International Journal of Operations & Production Management*, 21 (1/2), pp.71 – 87.
- Gunasekaran,N., Rathesh,S., Arunachalam, S., Koh, S.C.L., 2006 . Optimizing supply chain management using fuzzy approach .*Journal of Manufacturing Technology Management*, 17 (6), pp.737 – 749.

- Håkansson,H., Persson,G., 2004. Supply Chain Management: The Logic of Supply Chains and Networks .*The International Journal of Logistics Management*, 15 (1), pp.11-26.
- Harris,J.K., Paula M.C. Swatman, Kurnia,S., 1999. Efficient consumer response (ECR): a survey of the Australian grocery industry. *Supply Chain Management: An International Journal* , 4 (1), pp.35-42.
- Heng, M.S.H., Wang, Y. C., He, X., 2005. Supply chain management and business cycles. *Supply Chain Management: An International Journal*,10 (3),pp. 157-161
- Hoffman,J.M., Mehra,S., 2000 . Efficient consumer response as a supply chain strategy for grocery businesses .*International Journal of Service Industry Management* ,11 (4), pp.365 – 373.
- Horvath,L., 2001. Collaboration: the key to value creation in supply chain management .*Supply Chain Management: An International Journal*, 6 (5), pp.205 -207.
- Huan,S.H., Sheoran,S.K., Wang,G., 2004. A review and analysis of supply chain operations reference (SCOR) model . *Supply Chain Management: An International Journal* , 9 (1), pp.23 – 29.
- Inderfurth,K., 2005. Impact of uncertainties on recovery behavior in a remanufacturing environment: A numerical analysis. *International Journal of Physical Distribution & Logistics Management*, 35 (5), pp.780-798.
- Jain,V., Tiwari, M.K.,Chan, F.T.S., 2004. Evaluation of the supplier performance using an evolutionary fuzzy-based approach. *Journal of Manufacturing Technology Management*, 15 (8), pp.735 – 744.
- Jennings,D., 2002.Strategic sourcing: benefits, problems and a contextual model. *Management Decision*, 40 (1), pp.26 – 34.
- Johnson,M.E., Anderson,E., 2000. Postponement Strategies for Channel Derivatives. *The International Journal of Logistics Management* ,11 (1), pp.19- 36.
- Johnson,M., Pyke,D., 1999. A Framework for Teaching Supply Chain Management.Available at <http://mba.tuck.dartmouth.edu/pages/faculty/dave.pyke/download/teach-supply-chain.pdf>. Assesed on[17.3.07]
- Johnson ,P ZineldinM., 2003 .Achieving high satisfaction in supplier-dealer working relationships. *Supply Chain Management: An International Journal*, 8 (3), pp.224 – 240.
- Kaipia,R., Korhonen,H., Hartiala ,H. 2006. Planning nervousness in a demand supply network: an empirical study .*The International Journal of Logistics Management*, 17 (1), pp. 95 – 113.
- Kärkkäinen,M., Holmström,J., 2002 . Wireless product identification: enabler for handling efficiency, customisation and information sharing. *Supply Chain Management: An International Journal*, 7 (4), pp. 242 – 252.
- Kian Ng ,w.,W.K., Piplani,R., Viswanathan,S., 2003. Simulation workbench for analysing multi-echelon supply chains . *Integrated Manufacturing Systems*, 14 (5) ,pp.449 – 457.
- Koch,C.,ABC of supply chain management .Available at <http://www.cio.com/article/2826>. Assesed on [5.5.07]
- Koh, S.C.L., Gunasekaran, A., 2006. A knowledge management approach for managing uncertainty in manufacturing . *Industrial Management & Data Systems*, 106 (4), pp.439-459.
- Koh, S.C.L., Tan, K.H.,2006. Operational intelligence discovery and knowledge- mapping approach in a supply network with uncertainty. *Journal of Manufacturing Technology Management* , 17 (6), pp.687 – 699.
- Lalwani, C.S., Disney, S.M., Naim, M.M., 2006 . On assessing the sensitivity to uncertainty in distribution network design .*International Journal of Physical Distribution & Logistics Management*, 36 (1), pp.68-79.
- Lambert, Douglas M., Cooper,M.C., and. Pagh,J.D., 1998.Supply Chain Management: Implementation Issues and Research Opportunities, *The International Journal of Logistics Management*, 9 (20), p.2.
- Lambert,D.M., Pohlen,T.L., 2001. Supply Chain Metrics. *The International Journal of Logistics Management*, 12 (1), pp.1 – 19.
- Lang,J.C., 2001. Managing in knowledge-based competition. *Journal of Organizational Change Management*, 14 (6), pp.539- 553.
- Leavy,B., 2005. Supply chain effectiveness: strategy and integration . *Handbook of Business Strategy*, 7 (1), pp.331 – 336.
- Lemoine,O.W., Skjoett-Larsen,T., 2004. Reconfiguration of supply chains and implications for transport: A Danish

- study *International Journal of Physical Distribution & Logistics Management*, 34 (10), pp.793 – 810.
- Lin, B., Jones, C.A., Hsieh, C., 2001. Environmental practices and assessment: a process perspective. *Industrial Management & Data Systems*, 101 (2), pp.71 – 80.
- Lockamy, A.III., Smith, W.I., 2000. Target costing for supply chain management: criteria and selection. *Industrial Management & Data Systems*, 100 (5), pp.210 – 218.
- Lummus, R.R., Krumwiede, D.W., Vokurka, R.J., 2001. The relationship of logistics to supply chain management: developing a common industry definition. *Industrial Management & Data Systems*, 101 (8), pp.426 – 432.
- Ma, H., Davidrajuh, R., 2005. An iterative approach for distribution chain design in agile virtual environment. *Industrial Management & Data Systems*, 105 (6), pp. 815 – 834.
- Mason-Jones, R., Naylor, B., Towill, D.R., 2000. Engineering the lean supply chain. *International Journal of Agile Management Systems*; 2 (1), pp. 54 – 61.
- Mason, S.J., Cole, M.H., Ulrey, B.T., Yan, L., 2002. Improving electronics manufacturing supply chain agility through outsourcing. *International Journal of Physical Distribution & Logistics Management*, 32 (7), pp.610- 620.
- McIvor, R., 2000. A practical framework for understanding the outsourcing process. *Supply Chain Management: An International Journal*, 5 (1), pp.22 – 36.
- Meade, L., Sarkis, J., 2002. A conceptual model for selecting and evaluating third-party reverse logistics providers. *Supply Chain Management: An International Journal*, 7 (5), pp.283 – 295.
- Mejza, M.C., Wisner, J.D., 2001. The Scope and Span of Supply Chain Management. *The International Journal of Logistics Management*, 12 (2), pp.37- 55.
- Mouritsen, J., Skjøtt-Larsen, T., Kotzab, H., 2003. Exploring the contours of supply chain management. *Integrated Manufacturing Systems*, 14 (8), pp.686 – 695.
- Mukhopadhyay, S.K., Setoputro, R., 2004. Reverse logistics in e-business: Optimal price and return policy. *International Journal of Physical Distribution & Logistics Management*, 34 (1), pp.70 – 89.
- Myhr, N., Spekman, R.E., 2005. Collaborative supply-chain partnerships built upon trust and electronically mediated exchange. *Journal of Business & Industrial Marketing*, 20 (4/5), pp. 179 – 186.
- Neves, M.F., Zuurbier, P., Campomar, M.C., 2001. A model for the distribution channels planning process. *Journal of Business & Industrial Marketing*; 16 (7) pp.518-539.
- Piplani, R., Fu, Y., 2005. A coordination framework for supply chain inventory alignment. *Journal of Manufacturing Technology Management*, 16 (6), pp.598 – 614.
- Power, D., 2004. The comparative importance of human resource management practices in the context of business to business (B2B) electronic commerce. *Information Technology & People*, 17 (4), pp.380 – 406.
- Power, D., 2005. Supply chain management integration and implementation: a literature review. *Supply Chain Management: An International Journal*, 10 (4), pp. 252-263.
- Prater, E., Biehl, M., Smith, M.A., 2001. International supply chain agility – Tradeoffs between flexibility and uncertainty. *International Journal of Operations & Production Management*, 21(4/5), pp.823-839.
- Romano, P., Vinelli, A., 2001. Quality management in a supply chain perspective: Strategic and operative choices in a textile-apparel network. *International Journal of Operations & Production Management*, 21 (4), pp. 446-460.
- Rogers, D.S., Lambert, D.M., Croxton, K.L., García-Dastague, S.J., 2002. The Returns Management Process. *The International Journal of Logistics Management*, 13 (2), pp.1 – 18.
- Sachan, A., Datta, S., 2005. Review of supply chain management and logistics research. *International Journal of Physical Distribution & Logistics Management*, 35 (9), pp. 664 – 705.
- Sadler, I., Hines, P., 2002. Strategic operations planning process for manufacturers with a supply chain focus: concepts and a meat processing application. *Supply Chain Management: An International Journal*, 7 (4), pp. 225 – 241.
- Sahay, B.S., Jatinder N.D. Gupta, Mohan, R., ; 2006. Managing supply chains for competitiveness: the Indian scenario. *Supply Chain Management: An International Journal*, 11 (1), pp.15-24.
- Sánchez, A.M., Pérez, M.P., 2003. The use of EDI for interorganisational co-operation and co-ordination in the supply chain. *Integrated Manufacturing Systems*, 14 (8), pp.642 – 651.

- Shore,B., Venkatachalam,A.R., 2003. Evaluating the information sharing capabilities of supply chain partners: A fuzzy logic model. *International Journal of Physical Distribution & Logistics Management*, 33 (9), pp. 804 – 824.
- Simchi-Levi, D., Kaminsky, P. & Simchi-Levi, E. 2003. Designing and Managing the Supply Chain: Concepts, Strategies, and Case Studies. McGraw-Hill, New York. p(1).
- Simpson,D.F., Power,D.J., 2005.Use the supply relationship to develop lean and green suppliers. *Supply Chain Management: An International Journal*, 10 (1), pp. 60 – 68.
- Småros, J., Lehtonen,J., Appelqvist,P., Holmström,J., 2003.The impact of increasing demand visibility on production and inventory control efficiency. *International Journal of Physical Distribution & Logistics Management*, 33 (4), pp. 336 – 354.
- Smith,A.D., 2005. Exploring radio frequency identification technology and its impact on business systems. *Information Management & Computer Security*, 13 (1), pp. 6 – 28.
- Sparks,L., Wagner,B.A., 2003. Retail exchanges: a research agenda. *Supply Chain Management: An International Journal*. 8 (3), pp17-25.
- Spens,K.M., Bask,A.B., 2002. Developing a Framework for Supply Chain Management *The International Journal of Logistics Management*, 13 (1), pp.73- 88.
- Sridharan, U.V., Caines,W.R., Patterson,C.C., 2005. Implementation of supply chain management and its impact on the value of firms *Supply Chain Management: An International Journal*, 10 (4), pp 313-318.
- Srivastava,S.K., Srivastava,R.K., 2006. Managing product returns for reverse logistics.*International Journal of Physical Distribution & Logistics Management*, 36 (7), pp.524 – 546.
- Stonebraker,P.W., Liao,J., 2006.Supply chain integration: exploring product and environmental contingencies. *Supply Chain Management: An International Journal*, 11 (1), pp. 34 – 43.
- Storey,J., Emberson,C., Godsell,J., Harrison,A., 2006. Supply chain management: theory, practice and future challenges. *International Journal of Operations & Production Management*, 26 (7), pp. 754 – 774.
- Svensson,G., 2001. The Impact of Outsourcing on Inbound Logistics Flows *The International Journal of Logistics Management*, 12 (1), pp. 21 – 35.
- Tarn,J.M.,Yen,D.C., and, Beaumont,M., 2002. Exploring the rationales for ERP and SCM integration *Industrial Management & Data Systems*; 102 (1), pp.26 – 34.
- Tracey,M., Tan.C.L., 2001 . Empirical analysis of supplier selection and involvement, customer satisfaction, and firm performance *Supply Chain Management: An International Journal*, 6 (4), pp.174-188.
- Varma,S., Wadhwa,S., Deshmukh,S.G., 2006 .Implementing supply chain management in a firm: issues and remedies. *Asia Pacific Journal of Marketing and Logistics*,18 (3), pp.223 – 243.
- Warkentin,M., Bapna,R., Sugumaran,V., 2001. E-knowledge networks for inter- organizational collaborative e-business *Logistics Information Management*; (½), pp.149 – 163.
- Wieder,B., Booth,P., Matolcsy,Z.P., Ossimitz,M., 2006. The impact of ERP systems on firm and business process performance *Journal of Enterprise Information Management*, 19 (1), pp13-29.
- Wu,W., Chiag,C., Wu,Y., Tu,H., 2004. The influencing factors of commitment and business integration on supply chain management . *Industrial Management & Data Systems*, (4), pp.322 – 333.
- Zailani,S., Rajagopal,P., 2005 .Supply chain integration and performance: US versus East Asian companies *Supply Chain Management: An International Journal*, 10 (5), pp.379 – 393.
- Zeng,A.Z., 2003. Global sourcing: process and design for efficient management. *Supply Chain Management: An International Journal*, 8 (4), pp. 367 – 379 .
- Zsidisin,G.A.,Ellram,L.M., Carter,J.R.,Cavinato,J.L., 2004. An analysis of supply risk assessment techniques. *International Journal of Physical Distribution & Logistics Management*, 34 (5), pp. 397 – 413.

Note: See.(<http://www.wisegeek.com/what-is-supply-chain-management.htm> for more details).Assesed on [11.04.07]