

THE EFFECT OF SUPPLY CHAIN MANAGEMENT IN DEVELOPMENT AND INTEGRATION OF E-COMMERCE

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ABSTRACT

Increasing growth of Internet has brought significant effects in all aspects of human life; one of its most important applications is e-commerce development. E-commerce made fundamental changes in business patterns, including network economics composed of supply chain and E-commerce. In other hand, applying E-commerce in the present broad organizations causes challenges in addition to potential benefits. Knowing the challenges gives preventable resistance power to businessmen to think about solution of related problems and issues in advance. E-commerce doesn't mean only purchase and sale via Internet, but also it means an efficient commerce in all business levels, supply chain management (SCM) is cooperation, scheduling and controlling, production, storage and delivery of products and customer service, and it is the main pole and important element of E-commerce. Effectiveness of supply chain means having a sound product in a sound place in a sound time to cause in income and decrease in expense. Some of major companies, particularly American ones have used Internet as a platform to influence the supply chain recently. Also, various improvements in information technology potentials have changed the figure of industry compared to the previous decade. Obtaining and performing information technology is one of the approaches implying distinct competitive character to companies and supply chain. The information technology acceptance and efficient performance of it could improve cooperation between the members of supply chain through rapid distribution and transmission of acute information and applying information systems and could increase supply chain's efficiency.

Keywords: E-Commerce, Supply Chain Management, Supply Network, Smart System, Information System.

INTRODUCTION

In the present era, E-commerce is not only Internet purchase and sale, but also it is an efficient commerce in all business levels, in which the supply chain management could be name the major pole of this kind of commerce. Effectiveness of supply chain means an intact product in an intact place and time, that is possible to increase its income and decrease the expenses. Nowadays, competition has changed from exclusive companies to a broad domain of supply chain. The supply chain is a network of facilities for a network of companies that are eager to cooperate in different fields. All the levels that are achieved by supply chain can be used as a help to change the form of present companies by electronic commerce in today's communication age. In fact, E-commerce is an information tool to optimize business management and operation process, a tool that is provided by an aid from supply chain management. In addition, information technology applications are so important in supply chain management by two approaches of technology and information technology. By the way, the studies have indicated

that factors like organization's scope, success extent, uncertainty, and force from other partners of chain have a crucial role in information technology acceptance.

The continuous progress in communication and information systems and information technology will produce an evolutionary route for supply chain and development of techniques for its management. Today, the senior managers of productive companies apply different methods and tools to reach their commercial brands and meet their goals that are based on more portions from market. In this regard, some strategies are noticed that lead to more qualified product's supply and cheaper and more accessible products' supply. Therefore, they are always in an effort to reach an increase in flexibility of competitive benefit by a decrease in costs. In one hand, due to the mood of markets, today, containing increase of customers' expectations in price, quality, products variations and on time delivery and due to free stream of information leading to progress in knowledge and viewpoint of customers toward competitive products and because of significant developments achieved in production, carriage and ordering technologies, next, the direct expense of labor force, a double pressure is imposed on institute's foundation causing them refer back to answer the new of customers and providing their satisfaction and survival in competition of markets and communicate with suppliers in supply chain in one hand and move forward to link with customers to meet the strategic goals in another hand. In this regard, information technology and information systems of supply chain management play an important role. An efficient and effective SCM is formed based on exact information, carriage and distribution of it accurately, by a high quality and development and progress in SCM is specific for institutes that are able to delete their production and strange misleading plans caused by weak transferring of information and the present problem and errors inside. (Jiang, et al. 2009).

THEORETICAL BASIS

Supply chain management, has a large amount of effect on the country's industries by two factors of E-commerce and information technology, and increase benefits and customers' satisfaction. SCM has brought many developments in different fields of economy, commerce, production and ... (Hill et al., 2010). The significance of SCM is clearer when pointed at decision making and its sensitivity. Each decision in the management could have negative and positive effects and consequences, which its balance in each level of time is one of the most complicated affairs of the management type. Today, SCM is known as one of fundamental basis for obtaining electronic business in world. In the present age of current worldwide competition, one should make various products accessible according to request of customers. The customer's wish for high quality and fast service, has caused some pressures not existing before hand, as a result, the companies cannot do it alone. In the present competitive market, productive and economic markets, in addition to dealing with internal sources and organizations, find themselves in need of management and supervision on related sources and basis out of organization. The reason is that, in fact, access to benefit or competitive benefits is obtained by a goal of reaching a higher portion of market. Accordingly, activities like supply and demand planning, material production, production and planning, good storage service, stock controlling, distribution, delivery and customer service being already done in the level of company, now, they are moved to supply chain level. The key issue in a supply chain is management and balanced controlling of all these activities. SCM is a phenomenon, doing the activities so that customers could receive reliable



and quick service by qualified products and the least price. In general, supply chain is composed of two or more organizations being separate from each other officially, that are connected to each other via material, information, and financial matters. The organizations can be looked as institutes producing raw materials and components, final product or services like distribution, whole sale and retailing. Even the final consumers could be assumed as one of these organizations. Today, role, significance, and information stance is obvious for all. Proper turning and right transferring of information causes move efficient and effective processes and makes an easier management. Regarding supply chain, information system management and information system is proper, too. Balanced and proper management of information among partners will cause increasing effects in speed and accuracy and other aspects. Proper management of information makes more balance in the chain. Information management and information system series of supply could influence on many internal decision of different parts in supply chain that is suggesting the high significance of the components in SCM. Generally, speaking SCM is one of infrastructures of implementing E-commerce. In an industrial view, E-commerce often occurs in institutes and industries in which SC is formed. A manufacturer is always a factor in the center of economic activity process. All the existing elements of chain will obtain benefit by SC and as a result, the society will also obtain benefit through providing high quality and cheap goods. One of important elements of chain management is automation of buy and sell among members of chain. It is so important and crucial that, Automobile and aerospace industries, having the largest and the most complicated SC, have made networks through paying huge prices even before Internet was appeared. For SCM, stability is a significant and vital factor and complicated, stable and efficient forms of SCM are usually found just in giant economic institutes. The information technology and E-commerce application regarding execution and planning bring along huge benefits through a simultaneous decrease of costs and increase of customer's satisfaction. Investment is not usually adequate just on information technology, but also, basic changes in SC physical aspects may seem necessary, too for logistic potential benefits of 6 electronic type to be produced thoroughly. Therefore, competitive developments resulted from logistic electronic may lead to some threats for those competition not willing or able to reach such developments, so SC changes (being easier by logistic electronic) may not be noticed in some companies, as a conclusion or vice versa, in some other companies, they would lead to basic and costly changes in manufacturing approach. Due to reasons above, SC and logistic could not be considered as an efficiency or subject, but they are needed to be viewed as a central factor to achieve success in the whole company and management; and therefore, internal and external changes in SC activities may be a sufficient reason for a basic revision of some companies In the general strategy. The success of many private organizations and state and military ones is dependent on their ability to provide approved output. Supplying better products in a wide spectrum and by a lower price and its rapid performance, and desirable supply of output (costs, quality, performance, delivery, flexibility and innovation) depend on organization's ability in material and information direction and inside and outside money of organization. This process is known as SC. Since supply chains may be long and complicated and may include many commercial partners, some problems may cause, too. The problems are caused due to delay in solving customer's dissatisfaction and losing sale, and would bring high costs of solving for companies. Companies in the world class attribute most of success to SCM, something that is supported by management of contact to customer to a wide extent. (Patterson, et al. 2009).



Supply chain and its management definition

Supply chain is the process of good manufacturing and services to customers. SCM is supplier of needed factors to perform somewhat causing decrease in expense and benefit and its appearance can be attributed to technology development. SCM is a process that is changing and should be controlled and developed continuously according to expenses. Some basic principles of SC are customer' s satisfaction and decrease in expense, stock management and proper transferring of information and its transmission in due time that are largely influenced by powerful tools of Internet and web (Berry, et al. 2009).

The history of SCM

SCM is a result of rational development of logistic management. In the decade of 1960, the experts were involved in study about internal relation between storage and transmission, the result being distribution management. In evolution of this regard, logistic concept was announced. Indeed, logistic was generated through adding up manufacturing and planning management, and orders to distribution management. Discussion in SCM was studied seriously in academic conferences from early 1980 and most researchers have provided a framework and model for it (Saunders, etal. 2009).

E-Commerce

E-commerce has met widespread acceptance of societies during the recent years. Nowadays, a few people could be found to consider E-commerce strange. Magazines, radio and TV broadcast topics related to E-commerce every day, and people and experts study it from different aspects. Companies and institutes of supplying goods or service along with world evolution regarding E-commerce are making efforts to change logical and physical structure of their organization in this regard. It is necessary to create a proper mental image of conventional commerce at first before studying "electronic commerce". For the term "commerce", the following definitions are provided in most of glossaries: Social exchanges: Idea, beliefs and desire' s (demands) exchange, exchange, purchase and sale in goods in higher scale including transportation from one place to another. In following, the second presented definition of commerce is focused as a center of discussion on choice. Human life is full of commercial processes and commerce has been appeared in human life in million forms. While purchasing intended good from a store, one is involved in commerce and its other functions. When working in a company producing a good, one is involved with another chain of commerce. All aspects of commerce have the following features, mo matter which strategy or politics it has: buyers, those who intend to buy a good or service by money. Sellers, those who supply needed goods and services for buyers. The sellers are divided into two main groups: retailers, those who provide goods and services for applicants directly and wholesalers and sales agents who supply retailers and other commercial companies by goods and service. Manufactures, those who manufacture goods and services for sellers to provide for buyers. A manufacturer will always remain a manufacturer due to the work nature. The manufacturers sell their produced goods to retailers and wholesalers or to consumers directly. As it is observed, "commerce" has simple concepts in the following regard. It includes a simple purchase of "ice-cream" up to complicated elements like satellite lease. All aspects of commerce are focused on criteria like buyers, seller and manufactures; in the simplest level to its most complicated from. The following factors are in explaining all related elements in a usual commercial activity. In this mode, activity includes selling some products to consumer by a retailer: In case of trend to sell a product to a consumer, the basic factor is holding a particular



the good or service to supply. The good could mean everything. The seller may provide the good from manufacturer directly or from a sales agent. E-commerce makes it possible for individuals, organizations or institutes to create some totally novel models of commercial. In commercial companies based on signing mail-order, huge amounts of expense is spent for printing and sending catalogs, replying to telephones, and tracking orders. In E-commerce, the cost of catalog distribution and tracking the orders move toward zero, therefore, the possibility of good supply is provided with a cheaper price. The difficult and hard aspects of E-commerce, those mentioned as hard and tough operations related to E-commerce include: the existing traffic on site, secondary referral traffic on the site, differentiating with competitors, individuals' tendency to buy goods from referral site is one subject and purchasing from site is another subject. Relation and Interaction of e-commerce site with other existing data in companies are clear on internet of so many sites nowadays and creating a new site for E-commerce site with other existing data in companies are clear on internet of so many sites nowadays and creating a new site for E-commerce is not a tough work but audience engagement to visit the site and purchasing there, is the most significant issue existing in this regard. Factors known as simple operations related to E-commerce include: creating a website to sign orders and payment acceptance in creating an E-commerce site. The following factors should be noticed:

- 1) Suppliers: Without suitable suppliers, good presentation would not be possible.
- 2) Price: One of the most important parts in E-commerce is good supply with a suitable price. The comparison of a good's price is easily possible for customers and the price of a good will always be compared with similar items provided by sellers.
- 3) Contact to customers: E-commerce is a various collection of methods to communicate with customers. E-mail, knowledge bases, discussion forums, chat rooms, ... are some examples. The customer should always feel he would not stay unanswered in case of problem or seeking for more information.
- 4) Good distribution, After-sale service and possible sale returns are factors playing an important role in a successful E-commerce.



Social Exchanges

Idea, beliefs and trends (demands) in exchanging, purchasing or selling goods in a high scale including transportation from one place to another. In following, the secondary definition presented for "commerce" is chosen as the main pole and it is focused. In the simplest way, commerce is good and service exchange to earn money (income). Human life is full of commercial activities that are appeared in million forms. When purchasing a particular good from a store, one is engaged in commercial activities. If working in a company producing goods, one is involved in commercial chains. All aspects of commerce with each strategy or politics have the following features: Buyers: those who intend to buy a good or service using their money; Sellers: those who present good and services needed by buyers.

SIGNIFICANCE OF SCM

Supply chain as a system requires management like any other system for a proper function. The following examples point to balance and in fact management in supply chain:

One may stand in line to buy subsidized milk for so many times. Sometimes, there isn't enough milk and most of customers get back home unsatisfied while the news from nearby shop, says extra milk is available. Also, sometimes, milk is not distributed in one day but the seller is not aware in advance.

In supply chain of automobiles, one may be waiting a long time for ordered car while the car has been in storage for some time.

One may be waiting to change automobile's cylinder head in an after-sale center of cars, but despite the company's cylinder head delivery, the tools delivered to buyer with a delay.

A segment producer of cars may require plastic raw material to be imported from abroad for a final delivery to car manufacturer. If importing is not done due to a problem, the segment supplying will get impaired and perhaps, it is better for manufacturer to purchase a large number of segments directly from foreigner supplier, entirely. In the meantime, constructing the warehouse to keep huge number of materials is so expensive. In another hand, failure to meet the customer's order could impair the commercial future of segment manufacturer. The car manufacturer is not also having the same order prices to supplier and postpones the orders for a long time, sometimes. Thus, the costs and various risks of business influence on manufacturer's business. What is clear in the examples is the importance of balance between supply chain elements and proper good and information stream. Therefore, SCM is a combination of strategies used to untie performance of suppliers, manufacturers, warehouses and stores, in order for goods to be produced and distributed to a proper volume, place and time. Observing all the factors is when the costs of all the system is in minimum level and simultaneously, service level is kept, too. In the above definition, some elements should be focused.

First, SCM focuses on any institute that affects on cost and plays a role in intended product supplying of customer: From supplier and manufacturer's facilities to warehouses and distribution centers, stores and shops.

Second, SCM is aimed to access to efficiency and effectiveness of expense through the whole system. Thus, just minimizing the stock and transferring cost in not intended, regarded of the other costs associated with system. Including expenses that are not easily measured but are so important are the expense of losing a customer, decrease of competition ability and relative instability of SC members.

Third, since SC management is to unite all elements of SC, it also involves company's activities in all levels from strategic ones to operational one.



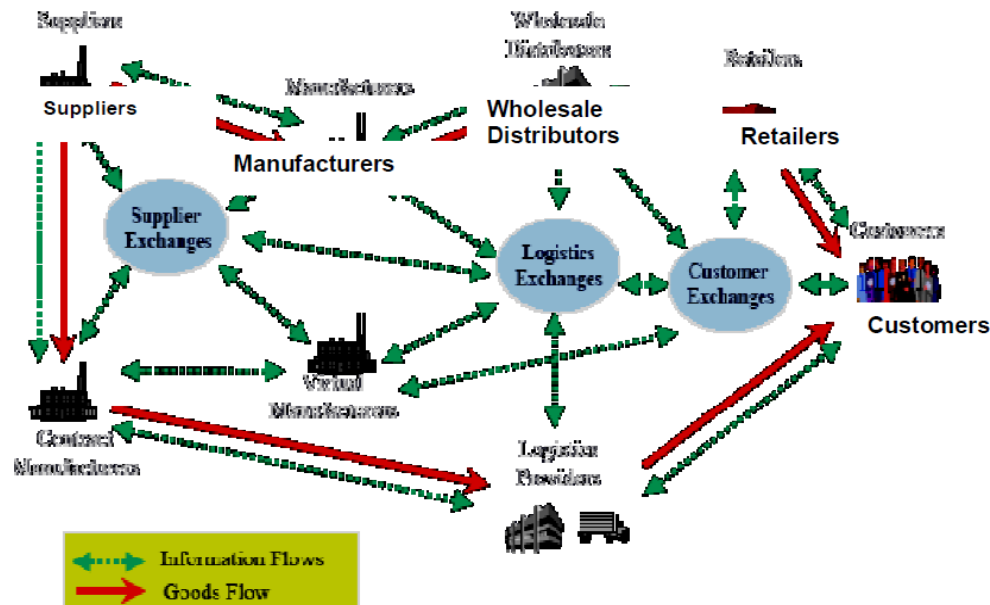


Figure 1: Materials and information stream in SC

In the present age, information is a key tool of SC in deciding about survival and development of institutes. The relation between all operations and processes is provided in SC by information, and the institutes in a SC would be able to decide properly and desirably through the relation's development to develop themselves and maximize benefits from SC in general.

Information is used in SC with following two aims:

- 1) Balancing activities associated with manufacturing, storage, location and transferring.
- 2) Predicting and planning in order to estimate the future demands and replications.

Exact, accessible and on time information lead to balance in different activities in SC and exact and efficient planning in different fields like planning demands, manufacturing, purchasing and planning material and transferring needs, too. Moreover, information in strategic planning has so many applications; strategic planning of SC contains ideals including development in surrounding and new markets, creating new facilities, and achieving desired success in markets. The exact information can make the operational decision and planning efficient to a high extent but, in contrast, it may be so expensive to gain such information and to install information systems.

SC CHALLENGES

There are several challenges making management on a SC and accessibility to an optimized planning hard for it, including:

SC is a complicated network of facilities, that may be so spread geographically. For example, imagine making a raincoat. The SC of such a product is shown in figure 1-2. China is the largest producer of cotton and textiles in this regard. The fur on the hat of raincoat is made in Thailand, which is the largest producer of artificial fur. Japan and Germany are the Zipper and button producers, respectively and Taiwan produces the outer layer, being professional in producing waterproof fabrics.



Different members of SC usually have different and conflicting aims. For example, suppliers ask manufacturers to be flexible in purchases of high-volume and stable ones and in delivery time. Unfortunately, although most of manufacturers are willing to have long manufacturing cycles, they should be flexible toward customers' various demands and needs. Therefore, the goal of suppliers stands in front of producers' request for flexibility. In addition, the producers/manufacturers' goal to produce larger scales is usually in conflict with warehouse keepers and distribution centers who wish decrease in stock. worse is that, decrease in stock volume means more frequent carriage operations during distribution and higher expenses coming from transferring goods, consequently.

SC is a dynamic system being completed during the time. Not only customer's demand and supplier's ability change during the time, but also relations of SC would be improved, too. For example, the higher customers' purchase ability, pressure on producers and suppliers to produce more various and qualified products; the more production of orders goods at the end.

System fluctuations during the time have been worth noting. Even when the demand is clear accurately (like documented demand in a contract), fluctuation should be noticed in demand and cost parameters during the time in the process of planning, due to fluctuations of season, ads, competitors, etc.

Integration

In past, companies supplying goods or a group of goods tried to be separate and focus on their own performance improvement or protection, but today, according to pre-mentioned challenges and high price of stock in wide supply systems needed to replicate the customers and increase in service to customer level, too, the companies should cooperate with each other in supply chains or networks but not like far-off islands, therefore one key factor in SC success is the possibility of cooperation and assistance among the members. This level of cooperation is called SC integration.

Integration includes elements that make SC companies to cooperate in longtime. First, in SC formation, suitable partners are needed for longtime partnership. The choice measure is not only cost, but also ability of partner in supporting competition ability of SC is crucial, too.

Second, realizing a network organization successful includes separate organizations that cooperation between 2 organizations legally. Each ring of SC is concentrated on its core competencies and it's not necessary for each ring to follow the general decisions of chain like a member of hierarchical organization, but experiential knowledge and information among the members of chain are shared and the competition among the members are replaced with a commitment to develop compatibility of whole chain. To improve cooperation in SC, several links could be made: like technical links, knowledge links, social links, management links and legal links.

Third, to manage a SC, joining of involved partners' strategies is so significant. In addition, some decisions should be made in the level of whole chain at least; like stopping the partnership with one member or integration with a new partner (Samieh et al., 2010).

THE ROLE OF SC IN ELECTRONIC PLANNING

In the first phases of SC movement, raw material production was not noticed so much but by entering a world based on web, raw material production lost its significance. Today, one could



access all sources for intended goods without existing workshop, one could exchange via Internet. The experts believe that planning industry is left behind in electronic technology and it should move forward to achieve technology. Because by its use, goods can be sent integrated via electronics and can be a help to customer to be aware of good stock in warehouses and apply valuable aspects of transmission, in order to save in costs by integrating the goods transferring. But most of planning personnel's confront with some troubles like lack of investment credit and difficulty in novel experts' employment for information technology to perform services, and freight agencies and other customers do not take benefit from adequate technology to take use of web services (Razmi et al., 2012).

ADVANTAGES OF E-COMMERCE OVER CONVENTIONAL COMMERCE

- 1) Decrease in cost, if the E-commerce site is implemented well, the costs associated with after-sale services after good supply are decreased.
- 2) More purchase in each transaction: site Amazon provides a characteristic not existing in the conventional stores alike. While reading the characteristics of a book, a part can be viewed stating that:
 "What else have people purchased after ordering the above book?" Therefore, the possibility to observe other related books bought by others, would be provided. Thus, buying more books is more possible by site observers compared to a conventional bookstore.
- 3) If website is designed so that, it is in conflict with other phases relating to commerce, more information could be possible for customers to obtain related to purchased goods condition. For example, if the company Dell registers condition of each computer from the production phase to supply, the customers will be able to observe the latest condition of their orders. Individuals can choose their good by different methods, using E-commerce. The existing websites in this regard will provide the following possibilities:
 - a) The possibility of registering an order during some days
 - b) The possibility of product configuration and observing real prices
 - c) The possibility of easy creation of complicated specific orders
 - d) The possibility of comparing goods' price among several sellers
 - e) The possibility of easy searching for needed catalogs.
- 4) Larger catalogs: A company is able to create a catalog on web that is never possible to do it through mail. For example, Amazon sell more than 3 million books, the information about the above book is presented via Amazon site and is placed for visitors, sending the above information via mailing, seems so hard or impossible.
- 5) Improving interactions with customers: The possibility of creating interaction with customers is provided by more certain methods with no expense, using a suitable designing of site and applying the associated tools.

For example, customer will be certain from order registering by receiving an e-mail or in case of sending goods for customer, one could be aware of it through an e-mail. A satisfied and pleased customer is always eager to purchase from the good providing company.

Regarding E-commerce, another note seems necessary.

THE EFFECTS OF INFORMATION TECHNOLOGY ON SC



Using information technology has the potential to improve members of SC to cooperate in order to create more efficient products for consumers. Information technology allows SC partners to perform as a single entity. Interestingly, the idea of applying information technology is not to pass the company's border to improve new thought efficiency. In the past, Forester suggested in 1958 that information transferring among companies decreases distorting demands in SC. Kaufman declared in 1966 that efficiency would develop when companies apply information technology all around companies' borders. In general, information technology leads to development in integration among SC members. Generally speaking, integration, planning, and balancing SC organizations aimed to access an optimized solution. It is tried in the present study, that the effect of information technology on SC is studied through 3 views of cooperation, business strategy development, and at the end, summary of studies.

INFORMATION TECHNOLOGY AND COOPERATION

The term SCM refers to the task of integration organizational units across a SC and harmonizing material flow, information and financial flow in order to meet customer's demand and aiming to develop competency in SC. Therefore, it can be presented that SCM's basis is based on 2 poles: integration and harmonization. Discussing integration, issues like choosing proper partners to cooperate as interagency and inside the organization and in discussion on leadership, getting involved partners' strategies in line are presented. In discussion of harmonization of different flows in SC, one issue being important is the subject applying information and communication technology suggesting IT significance in SCM.

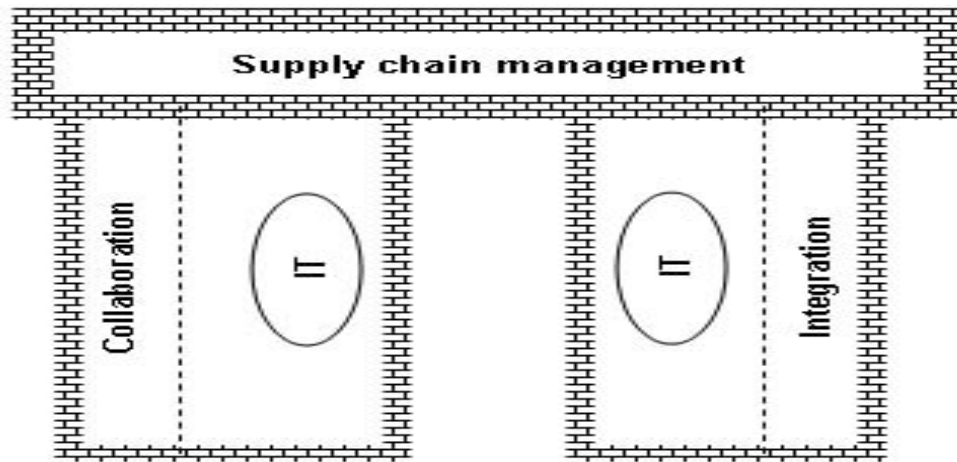


Figure 2: Two main columns of SCM

Collaboration included two distinct concepts of domestic and foreign collaboration. Domestic one is a two-way sharing process in two or more sections having mutual understanding and common views, common sources and collective goals. Foreign collaboration is similar to domestic one being different just in focus that is on chain instead of parts of different companies. In is needed saying that collaboration is not synonym of information technology. Most of companies suppose, harmonization is also generated automatically, as a consequence of applying information technology; while collaboration is the result of human interaction,

supported by information technology. Indeed, information technology is a concept, improving collaborative relations in two domestic and foreign aspects.

Due to effect of information technology on both domestic and foreign collaboration, it can be said that it affects on efficiency of organization's performance, largely. Sanders and Premus carried out a study on a proposed model to determine effect of information technology on domestic and foreign collaboration and ultimately on efficiency of organization's performance. Discussing collaboration in SC is so broad and widespread. One of the benefits resulted from collaboration in SC due to information technology being used and due to information systems in transferring and distributing information, is the effect because of bullwhip, meaning that little changes in product demand in lower levels of SC will be changed into larger fluctuations in demand while moving toward upper layers, by consumer (Karbasian et al., 2013).

SUMMARY AND CONCLUSION

Today, information inside an SC is considered to be an important factor for an optimized and desirable decision to be developed and survived and therefore, it contains 2 aims of harmonization and prediction and planning. According to significance of information flow and its role on SC, it can be stated that SC has 3 featured compared with private institutions: more cover, more accessing canals and desirable quality of information. Information technology, distribution and transferring information are developed by collaborative relations in two domestic and foreign aspects, by IT, and more effectively; they lead to improvement in SC's efficiency and avoid the bullwhip effect, too. Other effects of IT in SCM, one can point to increased responsiveness, creation of new relations with customers to know their needs, development of sale canals, development of chain performance efficiency, and progress in competitive condition. Factors playing role in IT acceptance in SC includes: size of company, extent of success, uncertainty, Pressure from other SC partners and support from chief manager of company. Based on importance of information in SC it can be concluded that the reason of most of inefficiencies in SC is lack of accuracy and appropriate information and competence of information systems that generate and process the information (Asoumi et al., 2000).

SC is not something except a collection of several companies gathering to provide a product or service, but it is to carry out the activities and to do the activities, informative communication is needed. Although association among the companies is not a new issue, creating such an association through IT and knowing required systems for information exchange is so vital, and applying IT can lead to improvement in the efficiency of whole chain. Today, the companies have found out that their sale section can be effective in enhancing efficiency and effectiveness, increasingly. And accordingly, companies have changed sale styles and tried to find a proper approach for their goods, so that sale department could meet buying strategic goals as a part in the company. To do it, for each strategic purchase, a strategic planning of purchase is needed for the intended good, it means, a strategic relationship with suppliers is needed. It is obvious that to do it, a strategic relationship should be made with competent and novel suppliers to be able to achieve competitive benefits due to strategic relations (Babaei, 2015).

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