

Role of the Information Technology in Supply Chain, Employment and Implementation

Mohammad Akhshabi^{1*}

¹Department of Industrial Engineering, Tonekabon Branch, Islamic Azad University, Tonekabon, Iran.

ABSTRACT

Management of the supply chain which in its new form includes some parts of the E- business as well is one of the new branches of the management which is progressing and developing day by day and seeks for the ways to reduce much more reduction of the cycle of the production of the desired product and services and it exploits from the newest developments of the science of the management and technology. The result of this affair has been the appearance of the figurative organizations, noticeable decrease of the costs, increase of the efficiency, noticeable increase of the profit, improvement of the general operation of the organization and promotion of presenting the service to customer. The changes formations resulting from the technology in the conditions of the market, transformation of the business methods, expectations of the available partners in the supply chain and, finally, demand for more created value on the behalf of the final customer or user are from amongst the available cases in the change of the situation of managing the supply chain. Unity of the activity of the supply chain with the technologies used to carry out these activities are from the competitive necessities in most industries. In this direction, it is necessary that the organizations harmonize themselves through the adoption and execution of the technologies of the supply chain and E-business. Otherwise, not only the penetration in to the new markets is impossible, but also, it may be that they cannot keep their own market share.

The purpose of the writes in this article is to study the applications and role of the IT in the supply chain and its effect on the general operation of the organization, its financial function, presentation of the service to the customer and, at the end, survey of the implementation of the informational technologies in the management of the procurement chain.

KEY WORDS: supply chain Management, Information Technology strategy.

INTRODUCTION

In the recent decade, the management of the supply chain has been gone out of the auxiliary, assisting and unnoticeable state and converted into a known strategic element which can has a positive and sensible effect on the activities of the organizations. The transformations resulting from the technology in the conditions of the market, transformation of the business methods, the new expectations of the available partners in the supply chain and, finally, demand for more created value on the behalf of the final customer or user are from amongst the available cases in the change of the situation of managing the supply chain.

Considering that the companies attempt to gain the more and better competitive advantages in the global environment, concentration is on the available relationships in the chain in order to create an efficient network [1].

As a tool, Internet enables the management of the supply chain to gain access to higher effectiveness and lower cost in business process [2].

Supply chain management is a set of approach utilized to 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. Today, material suppliers, channel supply partners (wholesaler, distributors, retailers, and transportation) and customers themselves are all key players in supply chain management. In order to efficiently and effectively manage a supply chain, as well as to gain a competitive advantage, use of information technology is increasingly become extremely important.

Information is the key to successful supply chain management because “no product flows until information flows”. For example the inventory manager needs direct access to the organization’s information system to properly administer materials flow into and within the organization.

Accurate and timely information allows a firm to minimize inventories, improve routing and scheduling of transpiration vehicles, and improve customer service levels. Different types of data are often used to control operations in an individual firm and are also used for negotiation among chain members that form a virtual organization to provide products and services to customers.

*Corresponding Author: Mohammad Akhshabi, Department of Industrial Engineering, Tonekabon Branch, Islamic Azad University, Tonekabon, Iran, Email: m.akhshabi@toniau.ac.ir

Thus, modern information technology will offer opportunities for the fast and safe transmission and processing of extensive amounts of data, both internally for users within the company and externally for suppliers and customers.

A study of the effect of IT on the supply chain and its influence on the general operation of the organization

In the recent decade, the supply chain has been placed in beginning of the organizational activities. On these conditions, companies relate electronically with their own supplier. They have arranged the inter organizational operations, in cluing the inside – of – organization operations and formed electronically the relationship with the key customers. In this direction, managers of the organizations search for the reasons and witnesses to show that these efforts will be followed by the better effectiveness of the organization. Since IT is a principal element in the management of the provision chain, the study of its effect on the today organizations is thus very important. Byrd and Davidson (2003) have mentioned that many organizations, despite the immense investing in the IT section, have not observed the positive results, while some others have proved the contrary to this subject by the presentation of the several reasons and documents and shown that very much profits have been gained by them through the investment in the IT. Many recent studies have presented the convincing reasons and witnesses to prove the positive effects of IT and deny it's contradiction with productivity and success of the organization [3].

As an example, references of 4, 5 have divided the supply chain of a company and organization in to a collection of the main activities, in bound logistics, out bound logistics, marketing and selling, services and the logistic activities as follows.

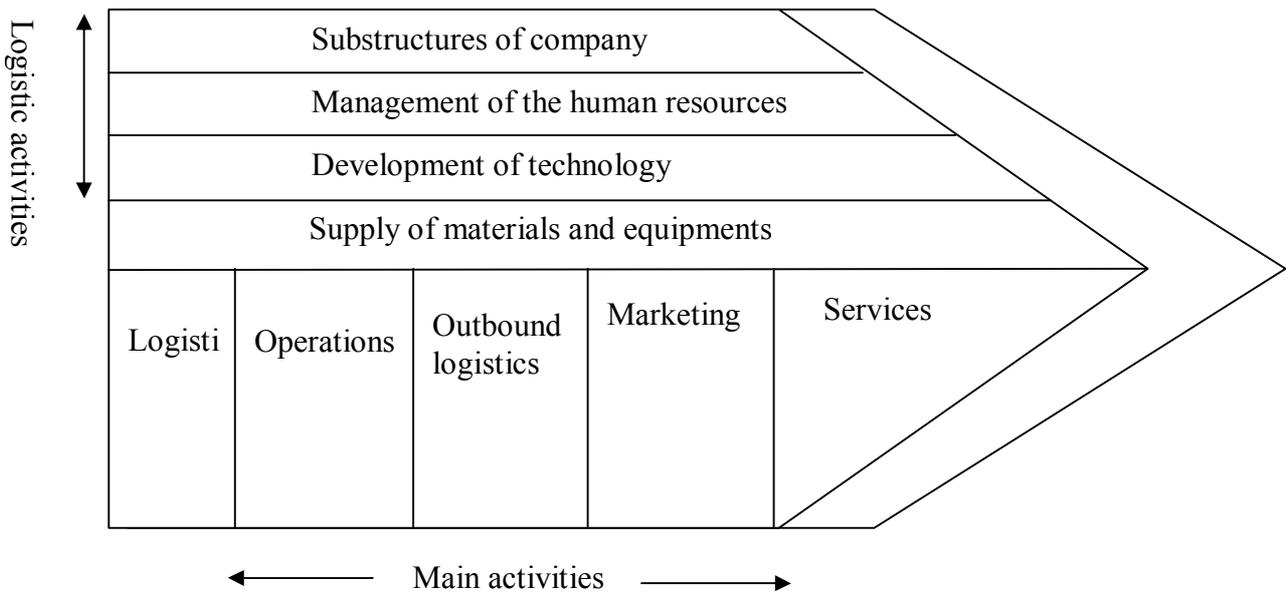


Figure1: supply chain and it's collection of the activities

Supply chain Management embraces these trading processes through which the productions, services and information’s creating the added value for customers can be provided the main objective in a supply chain is to decrease the lack of assurance towards the demand, delivery time, quality and completion during the chain [5, 6]. The main cause of many lacks of the assurance results from the weak current of the information. These weak points can include the inaccuracy, unseemliness and incorrect management of the information. Development of the usage of the IT in the activities of the offer chain has increase the potential of creating the value in the chain. Skill in the management of the information flow is one of the basic tools in the management of modern organizations. IT has the capability of managing the current of the information and affecting on the dimensions of the supply chain such as cost, quality, commodity delivery, flexibility and, finally, profit of organization.

Preliminaries of the adoption of the information technology in the supply chain

Multiple factors may influence on the decision of the organization based on the adoption and implementation of a particular technology. Corsi, Grimm and Patterson have classified the variables affecting the adoption of technology into 5 categories: Individual variables, task-related variables, innovation-related variables, organizational variables and the environmental qualification. The degree of the importance of these

factors is different based upon the task field or kind of the technology. Here, because the objective is to adopt the informational technology in the supply chain for the organizations, our focus is limited on the key environmental and organizational factors. The important point to which must be referred in this study is the concept of the word "adoption". Here, this word has a broad concept which covers the concepts of "creation, development and implement" of technology. The presented model in figure 2, environmental and organizational variables considered in this study and their relationship with adoption of technology of the supply chain has been shown.

Organizational Factors

The organizational factors affecting the innovation and the adoption of the technology are various. Organization size is one the variables on which the most quantity of the research has been carried out. The researches have shown that the big size organizations have more inclination in terms of having the financial resources and new technologies and admit more the risk of this issue. Regarding the small size organizations, it has been stated that, in these organizations, they benefit from more flexibility in terms of the smallness of their size and the less administrative and bureaucracy levels and, thus, the possibility of the appearance of the innovation is higher in them. This affair suggests the positive correlation between the sizes of the appearance of the innovation is higher in them.

This affair suggests the positive correlation between the size of organization and adoption of the technology [5].

H1: Organization and adoption of the technology [6].

The greater the organization in size, the more would be the probability of the adoption of technologies of the supply chain in it.

Organizational Structure is another important factor affecting the technology adoption. The past researches conducted on this subject have presented significant results; that is, some studies indicate the positive effects of the concentrated organizational structure (for example focused decision- making) on the technology adoption, while some other studies indicate its negative relationship. Supporters of the positive relationship believe that concentration of the decision-making may reduce the incompatibility and conflict among the organizational units. As a result, the possibility of the adoption of the new technologies is higher in these organizations. Some others believe that the organizations which benefit from the flatter and more decentralized organizational structure are to be expected more from them to adopt the new and creative technologies; because they can increase the connections and harmony in the organization, by itself, and the members of the chain. Since most organizations have observed the existence of the positive relationship between the decentralized organizational structures and have been the justifier this relationship, we give the priority to this relationship as well.

H2: The more decentralized is the organizational structure; the more would be the probability of the adoption of the technology of the supply chain in it [6].

Past operation is another organizational factor which is effective on the flexibility and the rate of the organization's inclination towards the regulation of the strategies and the competitive methods of creating the productions and innovative processes in order to response to the changes of the environmental conditions. The researches have shown that the past successful operations incline to be stable towards the change of the strategy. Also, the probability of conducting a strategic change is less in them. The strategically changes in the organizations having the weaker operations are higher and more extensive compared to the organizations having the better operation.

So, it can be said that the successful organizations have less motivation to adopt the technologies of the supply chain and change in the business relationships with the suppliers and customers.

H3: The less is the success of the organization in the past, the more would be the probability of adopting the technologies of the supply chain.

One of the long- lasting subjects raised in the literature of the strategy's subject is that the strategy is the introduction and director of the "organizational structure". In order to reach the success in the change of the out external environment and the inbound (inside-of- organization) strategy, the organizations must conform the organizational structure to the managerial processes. Also, conformity and harmony of a united supply chain and its logistic strategies with the general strategy of the organization is necessary for the success of that organization. Unification of the strategy of the supply chain with the general strategy of the organization is a determinant factor to gain access to success of an organization and protection of that success. The increase of the competitiveness which results from the unification of the supply chain and the effects that this affair put on the general strategy of the organization impels the organization to the adoption of the higher- level information technology, strategic unity among the chain members and, finally, the technological unification [6, 7, and 8].

H4: The organization, which possesses the strategy of the management of the unified supply chain management with the general strategy of the organization, the possibility of the adoption of the chain supply is higher in them.

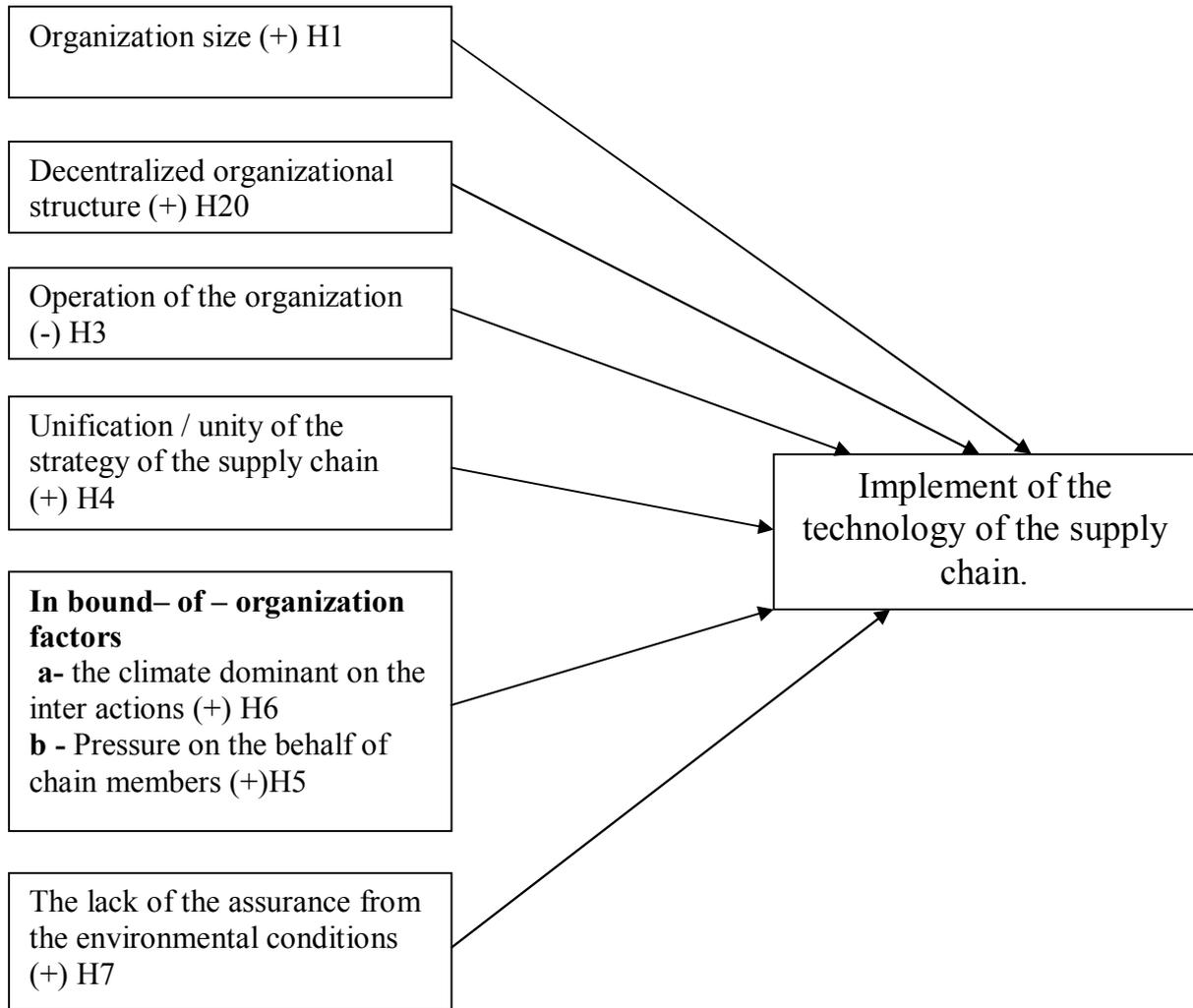


Figure 2: Preliminaries of the adoption of the technology of the supply chain

Environmental factors

There are multiple environmental factors affecting the decision making to adopt the new technologies. From amongst these factors, the economical conditions, global competition, climate dominant on the interactions, rate of the saturation of the desired industry and lack of assurance towards the environmental conditions can be referred. Here, we focus on two key variables which one of them is bound- of-organization factor and another is lack of the enviro ns mental assurance. One of the inbound – of organization factors which may be effective on the adoption of the technologies of the supply chain is the pressure caused (delivered) on the behalf of the available partners in the chain or desired chain the results of many researches have shown that the effect of the trading partners on the adoption of the technology focuses more on the adoption of EDI. While implementing the EDI, the company which is the beginner and pioneer in the adoption of technology causes to exercise pressure on the companies and attracts their attention. This task leads to the standardization of the data formats and development of the harmony and relationship in the organization and, also, the available organizations in the chain. In this direction, organizations have to either turn to adopt the technology or admit the risk of losing the business. Decision making to adopt the technology in the organization is more based upon an activity which is to be performed it's trading partners in this regard rather than the features of the EDI, by it self. The reason for this affair is that the effect and important role of the available partners in the chain is for the simplification and effective making of the interactions and development of the inside- of- organization relationships [6].

H5: the organizations, which are put under more pressure on the behalf of the partners of the supply chain, the possibility of the adoption of the technologies of the supply chain is higher them [6, 9].

Theories related to the social contacts and relationships assert that the social factors and inter organizational relationship, in addition to the factors related to the market, affect on the activities and interactions of companies. The climate dominant on the interactions is from amongst these social factors and inter organizational relationships. If the climate dominant on the interactions among the partners of the company is ideal and favorable, it will be led to the increase of the information exchange, development to the cooperation and harmony in the organization and the better results of the decision makings. Level of the available trust and assurance among the organization is one the key agents affecting the climatic conditions dominant on the interactions [6, 9].

The past relationships and the trading precedence of the company are an index which indicates the rate of the trust and reliability among the partners of the chain and thus the climate dominant on the mutual Trans actions and can be effective on the EDI adoption. The long – lasting relationships and being accompanied by the trust and assurance among the organizations have been raised as the main motivation in the electronically unity [6].

H6: the organizations which the climate dominant on their interaction is more ideal and appropriate the probability of the adoption of the technologies of the supply chain is higher in them [6, 9].

Another factor to which has been referred in many studies is "the lack of the assurance to the environmental conditions". This lack of the assurance may appear by one of the following factors; unpredictable demand in the customers demand, lack of the assurance towards the quantity and quality of the suppliers, severe fluctuations of the prices, unpredictable activities of the competitors, fast changes in the production processes and short lived cycle of the product are the principal factors of creating this environmental lack of assurance which the organizations often have not the correct and complete information to make a decision. In order to confront with this lack of the assurance and incomplete and incorrect information resulting from it, organizations may use the diversified mechanisms to promote the development and harmony among the organizational subsections and the chain partners.

Unreliable environmental conditions require the exchange of the information among the trading partners so that they are able to harmonize their activities proportional to the changes which are occurred and meet the expectations of the customers.

In addition, the lack of the assurance in the ultra – competitive environments of the today markets has made the time frame of the decision – making more limited and compressed and increased the necessity of the swift access to the more accurate information [6].

The advanced informational technologies which have been unified in the organizations or among the members of chain have allowed the possibility of the faster and more accurate subscription of the information [7, 6] the inversion of this issue is for the companies which are of the relatively stable and fixed operating conditions. In these organizations, the necessity to have and adopt – the information technology is less felt.

H7: The probability of the adoption of the technologies of the supply chain is more in the organizations which encounter with more environmental lack of assurance.

Conclusion

In the development and implementation of an united SCM, there were many complexities because of the IT out of which the cases such as the lack of the unification between IT and trading models, lack of an appropriate strategic planning, weak infrastructure for IT, failure of the application of IT in the figurative institutes, inexistence of the enough knowledge to implement IT in SCM were referred and it was discussed regarding a role which each of these factors could play in the success and effectiveness of the supply chain. As mentioned, there are multiple factors in the organization which are multiple factors in the organization which are to be affected by the employment and implementation of the information technology in the supply chain and, beside them, there some agents affecting the execution and implementation of various information technologies in the supply chain from amongst the significant factors studied in this article are the level of the technical skills of the IT section and the rate of the support of the senior manager from the plans and employment of the plans in the organization.

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