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# A Model for Implementation of Knowledge Management in Supply Chain

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## ABSTRACT

The main aim of this research is recognizing the knowledge management and supply chain as well as specifying a framework to implement knowledge management in supply chain. Supply Chain Management has been evolved over the years indicating going beyond a technical status to a global status at which the concept of operations has been indicated properly. In recent years, many authors used the concepts of both knowledge management and supply chain provided a seminal relationship between these two. Followed by getting to know about the concepts of basic accounts of management, it is believed that the topics associated to knowledge strongly dedicated to Supply Chain Management. The question of research helps to get to know how the analysis of knowledge creation process adapts with supply chain and what the leading factors in such a process are. This paper has been conducted based upon the knowledge management process using Nonaka matrix.

**Keywords:** KM, Knowledge Management, Supply Chain, KM Processing.

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## Introduction

Knowledge management is one of the most important competitive sources within every organization; this is in a way that the companies getting to know and attain knowledge management faster can come successful in a competitive market. On the other hand, competition between the enterprises has lost its importance and completion among supply chains to provide maximum values to the customer has been addressed severely. Supply Chain Management has been assumed as the operating strategy in both infrastructures of production industries and services where it is over 10 years companies seriously have implemented the strategies of Supply Chain Management within the

organization. Knowledge management is the leading empowerment within Supply Chain Management assumed as a vital source of intensive information and multi-cultural organizational environments. Understanding the importance of knowledge management in supply chain is an attempt made in this paper whereby a conceptual framework has been provided for the knowledge management in supply management, this is realized by using a case study provided by French companies. To sum up, a summary of findings and conclusion for the knowledge management in supply chain have been proposed. In recent years, Supply Chain Management with its new approach within the

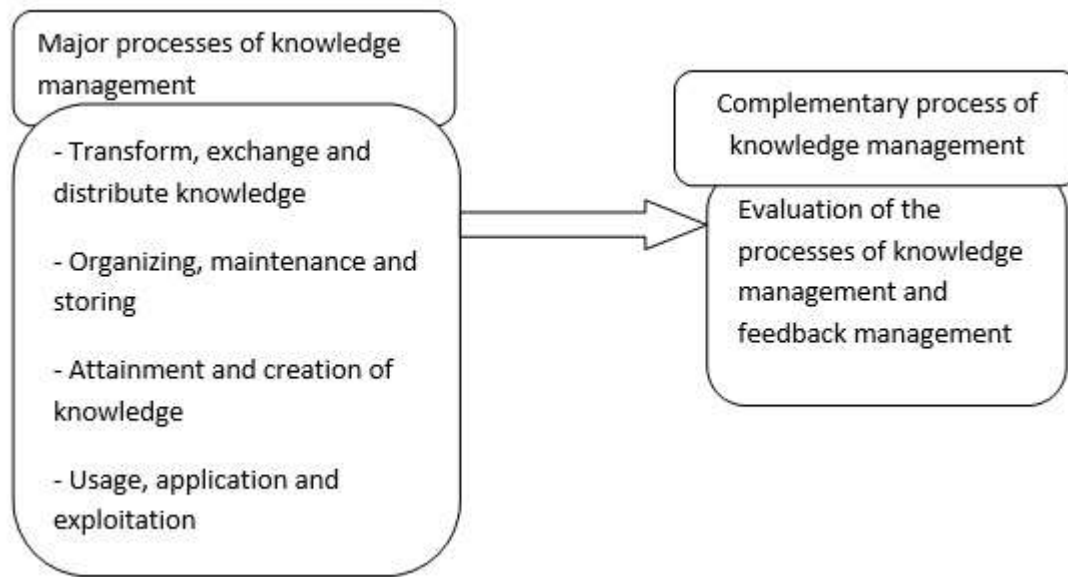
managerial tasks came able to bring about a significant change in reducing the performance costs and conducting the managerial tasks accurately within the organizations. Yet, performing Supply Chain Management can be assumed effective within the organizations whereby it can be assumed to reply the objectives existing in the organization and interact with the objectives and sources of the organization. One of the important issues within the organization is the very notion of drawing attention to the knowledge management where if this gets accomplished accurately within the organizations and used properly, so, Supply Chain Management can be emerged as a strong instrument within the organization. In today's competitive age at which the organizations continue competing with each other and developing their products and services, the factor of knowledge has been known effective.

### **Problem Statement**

Nowadays, the performance of knowledge management and its leading role within the organization has been found effective as a well-known criterion whereby every of the organizations attempts to access such new knowledge. In this regards, use of Supply Chain Management associated to getting help for improvement of knowledge management can be sufficient helping for the most development and improvement. Hence, this paper intends to recognize the Supply Chain Management within the organizations, and then recognize and observe the factor of knowledge within the organizations and also find about the leading role and importance of it within the organizations in order to apply the Supply Chain Management and necessary information. A new approach governed in recent years on operation management is the approach of

Supply Chain Management. Supply chain is a system of facilities and distribution centers obliged to transform natural resources, raw materials, and components into a finished product that is delivered to the end customer. There exist supply chains within the manufacturing and service organizations, however, complexity of chain may change from an industry to other industry and/or from a company to other company. This paper intends to introduce this new approach in operation management; thus, the main aim of this paper is to introduce this matter of importance to make the addressee familiar with it. The issues observed in this paper include definitions of Supply Chain Management, Value Chain, demand chain, supply chain, needing to Supply Chain Management, benefits of Supply Chain Management, elements of Supply Chain Management, tactical, operational and strategic topics in Supply Chain Management and so forth. In the end, presenting a conceptual framework for Supply Chain Management and proposing a new competition in the operation management helped to come to an end and provide a proper conclusion. Supply Chain Management is a new approach governed on operation management in recent years. Supply chain is a system of distribution centers assumed to transform natural resources, raw materials, and components into a finished product that is delivered to the end customer. Supply Chain Management coordinates the activities in a way that the customers manage to attain the products with the highest quality and/or the least cost. Supply Chain Management can provide a competitive infrastructure for the companies. Supply Chain Management increases the company's tendency for cooperation and competition. Knowledge is the most important competitive advantage within the organization currently.

## Research Theatrical Model



**Figure 1.** A Model for Knowledge Management Processes within Supply Chain

## Research Background

### ***Knowledge Management Processes within Supply Chain***

Knowledge creation refers to the extent to which the knowledge created and developed by the organizations across the operation and task boundaries of organization for that needing to being provided with force to create new applications of the knowledge and exploit from new potential skills has not discovered (Liao, 2010). Sadra and Gabel (2010) believed that the stage of knowledge creation accordingly associates to planning and implementing the stages of life cycle of the organizational systems, where knowledge creation needs more specialization rather than the application of knowledge (Sadra and Gabel, 2010). To create knowledge in logistic, Fogit *et al.*, (2009) have introduced the indices including asking feedback from customers, observing the sites of customers to understand their needs, cooperating in sale activities, helping to customers to settle issues, cooperating with staffs to provide services to get to know how the services work, observing the

equipment and facilities available at that industry, observing the suppliers to learn about different aspects of their work, getting present in the communities creating the network, studying the governmental reports and legal groups and so forth (Fogit *et al.*, 2009). Halt *et al.*, (2004) have introduced for this process the indices including regular and periodic identification of customers' needs, annual evaluation of products' quality and chain services, evaluation of the impact on the changes within the supply chain (Halt *et al.*, 2010). Further, Lee Awo and Woo (2009) have introduced the other indices including the processes to attain knowledge from the customer, the processes to attain knowledge from the suppliers, getting feedback from the projects conducted previously, the processes to exchange knowledge with the colleagues working at business environment, getting information about new products in the industry, attaining knowledge from the rivals in the industry, evaluating the performance of modeling, determining the teams for recognizing the best measures (Liao and Woo, 2009). Masa and Testa (2009) in a

research focusing on the relationship existing between approach of knowledge management and organizational competitive advantage for the knowledge creation process, have introduced the indices including conducting the studies on market assessment and market, providing the research and development activities, studying the customer satisfaction, using the knowledge of customers and suppliers, market-orientation based on the information attained of industry and customer, being subjected to the information related to changes appeared in the market, cooperating with the international customers, being provided with the ideas of the employees. Hiring and maintaining the technical, specialized and trained individuals, respecting to individuals' ideas and attitudes aiming at persuading them to update their skills, building an open culture within the work environment, applying proper cultural circumstances within the organization to introduce the knowledge management and spending time to study the academic and commercial articles (Masa and Testa, 2009). Goldoon and Oliviera have drawn attention to the indices including the number of groups engaged in dealing with innovation of product and processes and the extent to which the *Intranets in knowledge management* have been used (Goldoon and Oliviera, 2010). On the basis of knowledge creation process, Danaei fard and Selseleh (2010) have introduced the indices including tendency to promote and improve the individuals' knowledge, using cash advantages to attain more knowledge, individuals' tendency to learn continuously to use the learning opportunities, using training systems for the employees, companies' information about their specialists in different fields, being subjected to organizational approaches to attract and maintain the knowledge-oriented employees, knowledge-oriented employees' satisfaction

from the human resource policies, personal investment dedicated to employees for the leading purpose of learning, the extent to which the senior managers persuaded the employees to attain knowledge (Danaeifard and Selseleh, 2010). According to the overviews provided above, the indices of this process in supply chain have been selected shown in Table 2. Maintaining knowledge includes placing knowledge in a knowledge reservoir so that it shows such maintenance by the passage of time. This reservoir filled with knowledge can be provided with an individual and/or an informational system. Maintaining knowledge can be attained by observations, experiences and measures (Sadra and Gabel, 2010). This stage is followed by recognizing a vital and important knowledge for the past and future, mentioning that storing it is reasonable and accessible for the employees working in organization. The factors including the structures to provide the information accurately and so fast, categorizing the information based on learning needs, the ability to provide information accurately on time, and also the processes to substituted previous knowledge with the new one, observing and analyzing the errors and failures within the organization is needed for Knowledge storage system.

### Questionnaires

This paper has been provided with a questionnaire including 66 questions which most of the tests have been appeared as tests, including 57 test questions and the remained included explanatory questions. In this regards, some questions associate to Knowledge Process Management, Nonaka Knowledge Matrix and Knowledge Management practices. Before providing the test, six supply chain specializations to reform the questionnaire have been applied. This makes us able to review the specific questions to combine some parts so far as

providing the research properly with the topics associated to knowledge management in supply chain. The questionnaire has been developed from five parts: 1- common areas of interest associated to concept of Nonaka, exchange the information among the colleagues worked at social process, sharing the knowledge associated to process worked out of the project, common interactions and creating common knowledge adapted with the combination process, distributing and transforming knowledge associated to the process worked in the field of this research. The introduction brought in this research indicates the research framework and objectives of questionnaire. The interviewee is asked to point out his relationship with a specific partner, mentioning that the interaction and/or the long-term relationship has to be asked here. The idea to refer to a specific problem has been proposed here where specialization mentioned essential to address the relationship between the manager and the partner.

### **Data Collection**

Most of the time, managing to develop the questionnaire (75%) is possible only by face to face relationship where a small part of the questionnaire (25%) controlled via email. Selecting the face to face status can be justified *via* the qualitative part of the questionnaire. It seems better to confirm it directly grounded on this topic. Data collection conducted by 4 months. The responses gathered at first where the responses entered to the questionnaires, then to the SPSS software.

### **Experimental Analysis**

Data gathered was analyzed using the operational questionnaire used for knowledge management model within the supply chain management so that analysis was mainly used to recognize the important factors leading to success in the field of

knowledge management, aiming at increasing competition in the supply chain. Further, data was gathered to get to know about the impact of knowledge management on the supply chain. Most companies working at the field of supply chain particularly the companies which merge the suppliers gave us assistance and consultation to gather experimental data. In this regards, the innovation, independence and tendency to share the information have been evaluated. Knowledge management with Nonaka process model and then data analysis was provided.

### **Impact of Knowledge Management on Supply Chain Management**

One of the important characteristics relating to the interviewer companies is that knowledge is assumed to improve the supply chain. To share data, the information and knowledge get exchanged among the senior managers and employees in order the success in the Supply Chain Management come to realize. One can see that the most important topics defined by respondents are assumed as Reliability in delivery (23%), Irregularities in the quality of goods delivered (19%), the costs associated to Poor inventory management (14%), potential supplier problems (10%), danger for the suppliers (10%). Most of them associate to the process at upward of supply chain. Here, It is addressed the knowledge management among the focal companies within supply chain. In spite of our belief grounded on this issue, the topics associated to sustainable supply chain, production planning and poor danger source have been shown. In general, it seems that the response from the respondents has been focused on the strategic operations. Among these factors, several questions have been asked from the contractors and suppliers. Since outsourcing has been transformed to the entire strategic operations of the world supply chain, the

relationship among the focal companies and the cooperative companies and exchanging knowledge among these companies are vital. To access proper integrative supply chain, organizational competition in terms of cost, quality, flexibility, responsiveness, trust and reliability has to be come to realize.

### **The Stages for Knowledge Creation**

In this part, the analysis on the spiral responses on the Nonaka process model referring to the facilitation of knowledge management in supply chain is specific among the focal companies. This paper intends to recognize the important factors leading to success in each stage of spiral responses to share the information and transforming knowledge management in supply chain.

### **Summary of Findings**

On the basis of the conceptual framework, it has been recommended for the knowledge management within supply chain and authenticity of model, the findings may come useful for further studies and using practically. One can see that while the an adverse condition exists in the infrastructure, 38% of the companies ask for giving the same point of interests with their partners to create knowledge. Exchanging the information helped while the common instruments did not used to create knowledge. This paper intends to show that learning can be used across the boundaries of company within the supply chain regarding knowledge creation through cooperating with each other. Developing the instruments lets the knowledge comes to a proper end, since it is shown that such instruments by the partners can be thought of knowledge. Socializing and outsourcing are two stages mentioned with proper conditions by the companies, but the stage of combination has been mentioned scarcely. This means that there are several barriers to share knowledge

where it is necessary to explore about the nature of these barriers later. If knowledge finds value and validity for the company mentioned as a competitive advantage, then based upon the base of knowledge, the methods of knowledge emerge within supply chain whereby they might be blocked via the combination stage. Knowledge management in the initial stage in developing supply chain has to focus on the social achievement by which the barriers existing in commercial relationship among the focal companies would be removed from the supply chain. During the socializing stage, the factors including Demand, Satisfaction, Redundancy, Abundance, and Automation play essential role in advancing the information exchange among the supply chain partners. The stage of outsourcing within supply chain knowledge management is of importance by which sharing the formal information among the structured meeting and the processes for information exchange provides advancement within the supply chain system. The important factors of outsourcing within supply chain management include Structural change, documents Official contract documents, Formal meetings and informal processes. The stage for implementation scheme of knowledge spirals on educational projects is internalizing where it is indeed transformed through the explicit knowledge to the implicit one among the knowledge management system, mentioning that this is possible via learning, fast solutions and sharing the information.

### **Conclusion and Discussion**

The procurement part of the organizations is of importance in increasing efficiency and effectiveness of them. Strategic planning of purchase, continuous evaluation of supplier performance, optimizing profitability in all sectors of the supply chain, proper use of the models to implement supply chain, develop

and advance the supplier relationships, building a cooperative approach in supply chain, develop information technology and electronic business. This paper intends to approve the knowledge management within supply chains. In the light of affecting on supply chain management by knowledge management, the supply chain performance would be influenced as well. With this presumption and considering the definition proposed by Niely *et al.*, (1995), one can see that the performance oriented to efficiency and effectiveness has been used to measure the impact of knowledge management on improvement of supply chain performance. The samples used in this research divided into two groups, pros and cons, where these two groups “agree and totally agree” and “disagree and totally disagree”, respectively. Mann-Whitney test has been used to determine the significant differences existing between these two groups. The results showed that for both questions about the effectiveness and efficiency, there is a significant difference between pros and cons groups. This means that applying knowledge management by the organizations can lead to the improvement of supply chain performance whereby a great impact of it on supply chain can be seen. Hence, the automotive companies have to draw their attention mainly to the advantages of knowledge management. With regard to the literature review, 17 critical criteria associated to knowledge management have been extracted and used to collect data. Accordingly, by using scoring the interviewees selected the more important criteria among these 17 criteria. These factors were tested using Friedman test in the next stage, where the priority of these factors was specified by the interviewees. It was concluded that the interviewees prioritized the factors of culture, support by the senior manager, human resource management and information technology,

respectively. Factor analysis method was used in the next stage where a small set of the factors was chosen. The factors include leadership, strategic tools for knowledge and processes, human resources and sampling. The mean of two criteria effectiveness and efficiency stands for the impact of knowledge management on supply chain performance, so it can be used as a dependent variable to provide regression analysis. Regression coefficients have been used to predict the impact of independent variables on dependent variables. The results showed that the impact of the factors extracted from the factor analysis stage in regression model on supply chain is significant. To sum up, the correlation among the organizational characteristics including education status, age, work experience, job position and key factors was significant. Nowadays, information within a supply chain is a key factor determines a proper decision making for the survival of the organization so that purposes of coordination, prediction and planning are mentioned here. With regard to the importance of information flow and its role in supply chain, it can say that supply chain comparing to other individual enterprises include three specific characteristics as more coverage, the channels with more accessibility and proper quality of information. Information technology improves transforming the information in cooperative relationships in both domestic and foreign dimensions whereby the supply chain can be improved and no disturbance and collapse can be appeared in such situation. The use of Information technology has received significant attention in the supply chain context, which “involves the flows of material, information, and finance in a network consisting of customers, suppliers, manufacturers, and distributors”. Information technology can lower coordination costs, and in supply chain

contexts, digitally enabled integration capability can substantially improve transactional efficiencies through increased information sharing and communications capabilities, resulting in improved supply chain performance. The uses of information technology in supply chain management include the technologies such as Identification Codes, Automatic Identification, Barcode, Electronic Data Interchange and Internet Technology. Further, information systems and applied software and specialized systems are other uses of information technology. The factors playing important role in accepting information technology within supply chain include size of organization, the extent of success, lack of trust, pressure on other partners working on supply chain as well as support by senior managers working at the organization based on the importance of information within supply chain whereby it can come to an end that the reason for most of the deficiencies and bottlenecks existing in supply chain is lack of accuracy of information and insufficient information systems applied for processing information. More broadly, integration across separate stages of a supply chain allows each supply chain partner to focus on the operation at its own stage; this may eliminate the burden of acquiring duplicate resources (which are required by operations at other stages), thus increasing resource utilization and decreasing operational costs. Cost reduction can be further achieved through resource synergy among horizontal partners (Lee 2002). For instance, because of the risks of supply disruption, firms often keep safety stocks for key components. Holding excess inventory, however, reduces asset productivity. Alternatively and more effectively, firms can share safety stocks with other firms that also need the component. Supply chain is a set of several companies get together to provide services or products

where this set needs information technology to perform tasks, however the relationship among the companies is not a new idea, building such relationship *via* information technology and recognizing the necessary systems are vital to exchange information so that adopting information technology can lead to improvement of efficiency throughout the entire system. In sum, one can say that supply chain management includes three massive parts: Procurement, Production and Distribution. Further, three types of management are possible for the supply chain management including information management, logistic management and Relationship Management. These are well defined in this paper. Due to the fact lied in not being able to define this issue here, so this paper intends to examine different aspects associated to this issue whereby upcoming studies can be conducted easier. One of the factors leading to the success in each organization is having efficient and effective supply chain and a proper management. In this regards, accurate and regular information exchange among the members working at supply chain not necessarily placed in a unique geographical region or the chain with lots of complexities in a grid is of importance. Hence, needing to an efficient inventory management system is fundamental. Designing and performing such system regardless of information systems and information technology are practically impossible. The systems used in supply chain raise to making relationship with customer and transforming information by the customer to the organization by which the information with high transparency, accuracy and reliability can be provided so as the entire planning for the processes. These systems create competitive advantage and guarantee the survival in such a way that enables organizations to use actual data of production demand instead of the methods of demand prediction. The present study has



attempted to investigate demand chain network in knowledge management. The objective of the study is to discover the application of knowledge management model or framework existing in selected French companies through data gathering and empirical analysis. the selected model is based on four stages of Nonaka's spiral model. This model seems interesting from the beginning of knowledge management evaluation. But developmental advancement takes place after above one decade; especially when demand chain is presented as a complementary part of strategy operations and generally, it is not so appropriate for supply chain management. Although empirical analysis makes better understanding about distributive features of knowledge management in supply chain management, a multiple case study with details, the sum of information based on the knowledge management model not only contributes to develop more details but it can be useful for its constitute. It can be stated that the findings of the present research is not only specific to French companies and can be applied for other countries. Another study also evaluates this hypothesis. Even if few researches are related with knowledge management from inter-organizational perspective, the results are confirmed by a Canadian study indicating that developing supply chain management methods are related with more efficient knowledge management processes.

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