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# Supply Chain Project Studies

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**ABSTRACT: This article is a mini review paper to explore recent studies in supply chain management for a class activity in Operations management tutorial under University Malaysia Pahang Undergraduate Programs. In this paper a team of students as their tutorial work studied researches to find what the role of manager of chain of suppliers is.**
Keywords:Supply Chain, Management; Literature review

## INTRODUCTION

Nowadays, the fierce competition in today‘s global markets and introduction about the new products with shorter life cycles and also the heightened expectations of customers have forced business to invest in and focus attention on their supply chain. This, together with continuing advances in communications and transportation technologies such as mobile communication and internet has motivated the continuous evolution of the supply chain and the techniques how to manage it effectively. First of all, the definition of supply chain management is 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. This definition will leads to several observations. First obser vation is supply chain management takes into consideration every facility that has an impact on cost and plays a role in making the product conform to customer requirements. Secondly, the objective of supply chain management is to be efficient and cost-effective across the entire system of total system wide costs from transportation and distribution to inventories of raw materials, work in process and finished goods are to be minimized. Last observation is the supply chain management always revolves around efficient integration of suppliers, manufacturers, warehouses, and stores. This thing will make it encompasses the firm‘s activities at many levels which is from the strategic level through the tactical to the operational level. Other than that, some supply chains are simple, while others are rather complicated. The complexity of the supply chain will vary with the size of the business and the intricacy and numbers of items that are manufactured. For the additional information, simple supply chain is made up of several elements that are linked by the movement of products along it. The supply chain starts and ends with the customer. It also has three levels of activities that different parts of the company will focus on strategic, tactical and operational**.**

## REVIEW

The paper tells us the specific requirements towards cooperative planning in the centre of any supply network that is formed by a pair of manufacturer‘s authority and supplier who have asymmetric information on forecast on demand and costs, in each specific cases. Then a new way that were suggested to explore this problem of supply-chain management is by means of the apparatus of mechanism design. The results of the analysis in some specific properties that are provable for efficiency and truthfulness, and shows the impossibility or absurdity of fair cost and profit sharing. Next, design some principles towards a payment scheme that are devised that provide incentive for the partners to cooperate in order to minimize the costs. This payment can be assumed as the price for a flexible supply service. For instance, the generic framework is immediately with two particular cooperative supply mechanisms. For instance, Tenaga Nasional Berhad. They give salary to their employee based on their performances including the soft skills. [1]

Supply chain was been considered in which a producer supplies a fresh products to a distant market through a third-party logistics (3PL) provider, where a distributor purchases and sells it to their customers. The product is easily damaged. Both quantity and quality of which may decline during the transportation processes. The demand of the market is random, directly proportional to the selling price as well as the freshness of the product. We obtain the best decisions for the three supply chain members, including the transportation fee of the third-party logistics provider, the producer‘s shipping quantity and wholesale price, and the distributor‘s purchasing quantity and retail price. We find that the presence of the 3PL provider in the supply chain has a specific impact on the performance. We propose an incentive scheme to make the supply chain consistent. The scheme consists of two contracts, including a wholesale-market clearance (WMC) contract between the producer and the distributor, and a wholesale-price-discount sharing (WDS) contract between the producer and the 3PL provider. We show that the contracts that had been proposed can eliminate the two sources of __double marginalization‘‘ that exist in the three-tier supply chain, and encourage the three parties to act in a coordinated and arranged way. As example, the McDonalds company. They have made some black and white agreements with their suppliers about the price and condition of the salads, chickens, and burger breads according to customer‘s wants and the global prices of raw materials. [2]

This study designates Green Supply Chain Management (GSCM) strategies to effective direct business functions and activities in the electronics industry. Enterprises conduct scanning to the environment to understand the external environment and internal functions, a successful strategy identifies unique firm-owned resources and change them into capabilities. This study of supply-chain management proposes a network to declare the levels of managerial and firm-related content. It derives four business functions from product life cycle management which are design, purchasing, manufacturing, and marketing and service—and associates their related activities with __greenness‘‘. These functions and the activities are the network clusters and its elements in an analytic network process (ANP) model with dependent relations. A thorough procedure solves complex GSCM strategy-selection problems and evaluates the most

important activity in each business function. A case study takes a leading Taiwanese electronics company to identify the proposed procedure‘s stability. [3]

Recently, the competition in the global construction market has increased. Thus, several research efforts have focused on the application technology (IT) as a way to improve the process of integration of the construction supply-chain management (CSCM). They said that it will be clearer when we use visual representation because this can provides effective tools for monitoring resources in the CSCM. In order to support this objective, this paper consolidates the building information modeling (BIM) and geographic information system into a unique system that can make the supply-chain status always on the track. It also can provide warning signal in order to making sure the delivery of materials. The term _supply-chain‘ used in this article is to define the stages through overall construction resources which are material, equipment and personnel. Supply-chain in construction is more concerned to the planning and directing the discrete quantities of materials to the construction site. If we take a closer look to the supply-chain management in construction sectors, it will show the considerable amount of wasted product is rooted in poor management of the material supply-chain such as delivery services, inventory, and communications. In this case, the use of IT is one of the way to achieve better logistics processes and avoiding delay. For instance, Pos Malaysia. They provide their customers with tracking number of their posted products. This is beneficial for the customers to key in the codes to Pos Malaysia website to check the delivery status and where the geographical positions of their posted things. [4]

Consumer goods industry is a highly competitive field, and globalization and economic integration have a tremendous impact on the supply chain operation of consumer goods industry. Based on this, introduces the problems and challenges from channel demand chain, put forwards demand oriented supply chain collaborative plan and its value, and then builds the framework of the collaborative plan, and briefly describes the characteristics of various activities and internal relationship between each other. Based on this, a case is introduced to be analyzed empirically. At last, summarizes the key elements of successfully implementing the collaborative plan. For example, KFC Holdings make cooperation with 'Region Food Industries Sdn Bhd (LIFE) as a major supplier of chilli sauce, thai sauce, and tomato sauce are all the KFC outlets throughout Malaysia. [5]

The formulation and implementation of effective coordination strategy among members is key to promote sustainable development of Green Supply Chain (GSC). Combining with the specific situation and establishes the product utility diversity model and supply chain revenue model based on custom market demand caused by green products' utility diversity, and examines the coordination between manufactures and its upstream suppliers under Stackelberg game and cooperative decision-making respectively, resulting to two pricing strategies as well as market conditions for GSC to operate regularly. In addition, formulating coordination pricing strategy of the wholesale price based on cooperative decision-making strategy achieves the members' Stackelberg equilibrium profits Pareto improvement. We conclude the results of crucial significances for collaboration of members who promote the initial GSC and for the development of green market. IKEA will be ensure that the suppliers of furniture and wood products that deal with a stick that is not derived from an endangered tree species. This is based approach IKEA Green 'was practiced as part of its corporate culture. IKEA believes that its green practices in supply chain management not only helps protect the environment but also ensure long-term supply of raw materials. [6]

Besides that, explore the relationship between supply chain management strategy and chain management practices on supply chain performance. The main tools of data collection instrument used was a questionnaire which was administrated to a total sample of 200 managers are classified by job title and respondents are also classified by their job functions are corporate executive, purchasing, manufacturing/production, distribution/logistic, SCM, transportation, material, and operation from Malaysia manufacturing industry. The response rate was 62% while 51% was usable questionnaires. Sample selection was based on convenience sampling. The data were analyzed using mean, standard deviation and correlation between independent and dependent variables. The analyses involved statistical methods such as reliability and validity tests and multiple regressions. The finding showed that supply chain management practices have a significant relationship with supply chain performance statically. However, supply chain management strategy is a weak predictor of supply chain management performance. [7]

Furthermore, investigate the relationship between organizational practices and supply chain agility. Data collection instrument used was a questionnaire which was administrated to executive officers, directors, presidents, vice presidents, managers and senior staff from manufacturing firms in Malaysia. In order to contact of respondent in efficient and cost effective manner, it was decide to distribute questionnaires to respondents through mail. The response rate was 70% while 63% was usable questionnaires. Sample selection was based on convenience sampling. The data were analyzed using mean, standard deviation and correlation between independent and dependent variables. The analyses involved statistical methods such as reliability and validity tests and multiple regressions. The finding showed that supply organizational practices have a significant relationship with supply chain agility. This also shows that supporting technology moderate the relationship between organizational practices and supply agility do exist. [8]

Discussed on the managerial and research implications of sustainable supply chain management. We analyzed current researches about the sustainability and its introduction into the supply chain. And then, based on the necessity and requirements of sustainable supply chain management, we argued about what kind of strategies the company should conduct to obtain the sustainability in its supply chain. Finally, from the viewpoint of the company having the not-sustainable supply chain, we established the framework for strategy development to construct the sustainable supply chain, which could help the company in making a practical application, as well as could be suggested as research directions of future works to support it. For example, the UDA HOLDINGS is a well known compan y in the field of property management, construction, malls, hotels and resorts. The company of Uda Holdings over managing the efficient production and maintaining good relationships with suppliers of raw materials. Therefore, good management with employees and suppliers can further increasing company profits. [9]

Supply chain management is the active management activities to maximize customer value and achieve a sustainable competitive advantage. It represents a conscious effort by the supply chain firms to develop and run supply chains in the most effective & efficient ways possible. It also cover everything from product development, sourcing, production, and logistics, as well as the information systems needed to coordinate these activities. The organizations that make up the supply chain are ―linked‖ together through physical flows and information flows. Physical flows involve the transformation, movement, and storage of goods and materials. They are the most visible piece of the supply chain. Information flows allow the various supply chain partners to coordinate their long-term plans, and to control the day-to-day flow of goods and material up and down the supply chain. [10]

Supply Chain design and operational decisions need energy to keep the products flow to the customer. It is quite challenging to determine the energy consumption and to understand the impact of design and operational decisions on the energy consumption. There are a few simulation used in this problem. Firstly, Hierarchiral simulation. It is base approach for estimate the energy consumption to keep products flowing through supply chain. Next is System Dynamics Simulation. It is used at a high abstraction level to understand the major factors that may affect the energy consumption. Discrete Event Simulation used to delve down in details for evaluating the critical stages in the supply chain. [11]

This day, we can use technology such as internet in supply chain. It is call virtual supply chain. Virtual supply management does no longer require physical proximity. It can be manage or control from many places by other people. We can use internet to communicate order release against blanket purchase order .For example, online shopping. We just search the things that we want to buy in the internet, then we order it after that the supplier will send the things to us. It will removes fundamental constraints concerning place, time and human observation. The other example is Kentucky Fried Chicken restaurant (KFC).When restaurant out of stock for example chicken, the manager will order it from supplier through virtualization. Then the supplier will reply when they will send the stock. So simple and easy. [12]

With the development of economy and information technology, the competition between enterprises is decrease and the competition between supply chains is increase. Reducing total cost cannot satisfy the customer demands. Using the system engineering concepts, the system dynamics models of traditional supply chain and leagile supply chain are built. Leagile supply chain is a new conception that proposed in context of customer demand. The advantages of leagile supply chain is inventory, quick response to market demand and shorten the length of supply chain. The advantages of leagile supply chain can be shown through comparing the simulation results of this two kinds of supply chain. We can determine the relationship among effects factors of leagile supply chain and observe the visual dynamics change of supply chain by running the simulation model. Thus, this results can provide decisions support to enterprise leagile supply chain. The advantages of leagile supply chain are inventory, quick response to market demand and shorten the length of supply chain. [13]

The key competence in manufacturing companies is the capability to concurrently design the product and supply chain. This competence is still underdeveloped in industry. The lack of convergence of the methodologies for concurrent product and supply chain design in the research community has caused the research not able to fill this industrial capability gap. Moreover, a dominant and practical methodology in concurrent product and supply chain design in the industries has not yet emerged. Uncertain of the complexity and effort of concurrent design industry has been reluctant in adapting concurrent design methodologies at all or to the full extent. [14]

The suitability of Complex Adaptive System (CAS) modelling for making complexity-optimizing supply chain decisions is discussed on example of semiconductor supply chain. CAS are systems far from equilibrium, characterized by a large number of interacting and evolving agents, who adapt and learn and thus could be able to solve the complexity dilemma. A promising approach for managing supply chain complexity is the interpretation of a supply chain as CAS. The factors that led to a global dispersion of supply chain is new global market, lower manufacturing costs and sourcing activities. Scientists and business experts agree that the complexity along the supply chain is high and has increased even further in recent years. The mounting complexity products, processes and companies has been fuelled by trends such as globalization, diversity of variants and declining manufacturing depth along with ever shorter product life cycles.[15]

Energy source supply chain is the new research concern in supply chain management. There are some factors that that make energy sources supply chain management to success which is the supply chain coordination leads to increased information flow and reduced uncertainty. The study of energy sources supply chain consisting of one energy source vendor(SV) and one energy sources integration provider(SIP).The information sharing coordination of energy sources supply chain can be develop between SV And SIP. Energy sources supply chain is very important and necessary for improvement and minimization of value leakage. The key that approach to achieve supply chain coordination is information coordination. The interaction between SV and SIP may be different if there are multiple SIP‘s competing for the same customer. [16]

Supply chain management is the major concern on process excellence from organizational points of view. The efficiency and effectiveness of supply chain management can be increased by the application of radio frequency identification (RFID) technology and lean production. A journal had stated that: ―numerous organizations are planning to, or have already adopted RFID in their operations in order to take advantage of a more automated and efficient business process‖ [17]. Its shows that, RFID had been implemented by many company or organization in this world in an effort to gain more profits. The information technology system in RFID technology can help a company to achieve better supply chain planning and management through their accurate data. Thus, this is most probably the reason of many companies try to apply this technology. Pigni and Ravarini had stated that RFID technology integration improved the system business process and provide an inter-organizational information system that promoted the efficiency and effectiveness of the entire supply chain. The effect of RFID technology gives a big impact on effectiveness and efficiency supply chain of the organization or firms. [17]

Lean production also give a big contribution in effectiveness of supply chain. It was introduced by Toyota and the name at that time is ―Toyota production system (TPS)‖ or ―just-in-time (JIT)‖. Its aims to reduce waste, to improve their productions by using a continuous improvement approaches. Thus, lean production can reduce waste in human effort, inventory, and time for marketing. This can be a good tools for a company to develop from time to time and it have been stated by So and Sun. They emphasized that lean production was proved to be a tools for a company to develop continuously. By becoming a lean enterprise, a company or manufacturer can improve throughout, reduce cost and deliver shipment in shorter time. VSM technique was developed by the lean production. It help to rearrange manufacturing system according to lean perspective. Thus, supply chain of the manufacturer will become more effective with all this approach. Besides, an experiment that had been carry out by researcher showed that total operation time can be saved by 81% from current stages to future stages with the integration of RFID and lean production. [17]

In order to increase the efficiency of supply chain, an environmental aspect should be taken so that our environment will be conserved. Process to produces a product may need a raw material from our environment such as our forest. So, wasting sources might be happen in the process to produce a product. From enterprises‘ perspective, the most important way to manage environment is to develop more competitive advantages through improvement of environmental management ability. [18] Thus, green supply chain management is the way.

Green supply chain aims to optimize the resources allocation and achieve environmental compatibility. It need to change the idea ―treatment after pollution‖ and highlight the concept of ―reduction of pollution at source, prevention first, treatment second‖, to the design of product and purchase stages, full consideration shall be made about its impact on environment. [18] This give meaning that, a firm or company that want to buy the source should apply the concept and be more friendly to environment.

Green supply chain management give its own benefit better than traditional supply chain. If they do traditionally, main target for the enterprise is to pursue maximal economics benefit without take the responsibility at the expense of external interest. But, green supply chain management take both consideration. If all companies apply the concept of green supply chain, it means that, they have consciousness of environmental aspect. This importance because one day all the sources will be use up. All company can practicing economic activities in line with 3R principle, namely Reduce, Reuse and Recycle. Reduce means reducing the quantity of substance in the process of production. Besides, reuse involved in extending the time intensity of product and service. While, recycle highlight on the regeneration of renewable resources after use. [18]

As a conclusion, that why green supply chain management should be given more priority to all companies just to apply in their supply chain management. In exciting earning a big profit from any business, all companies and firms should take consideration to the environmental aspect because this planet is belong to all human being.

The concept of supply chain is about managing coordinated information and material flows, plant operations, and logistics. It provides flexibility and agility in responding to consumer demand shifts without cost overlays in resource utilization. The fundamental premise of this philosophy is; synchronization among multiple autonomous business entities represented in it. That is, improved coordination within and between various supply-chain members. Increased coordination can lead to reduction in lead times and costs, alignment of interdependent decision-making processes, and improvement in the overall performance of each member as well as the supply chain. Describes architecture to create the appropriate structure, install proper controls, and implement principles of optimization to synchronize the supply chain. A supply-chain model based on a collaborative system approach is illustrated utilizing the example of the textile industry. [19]

Supply chain management is built on the principles of partnerships and the development and use of the connections that exist between the links of the chain to provide information that will increase the efficiency of all members in the chain. Success stories abound describing lower costs, shorter lead times and increased customer service. Collaborative forecasting applies supply chain management concepts to the forecasting function and uses available information and technology to force a shift from independent, forecasted demand to dependent, known demand. Eventually, the future of forecasting may evolve to the point where forecasting is not even necessary. Demand information will be supplied completely by supply chain partners and the need to predict demand will be eliminated.[20]

**CONCLUSION**

Finally, as the conclusion, supply chain has three levels of activities that different parts of the company will focus on which is strategic, tactical and operational. Thus, the definition also will lead to the several observations. Other than that, the supply chain i s made up of several elements that are linked by the movement of products along it. On top of that, the supply chain also will starts and will ends with the customer. Furthermore, the benefits of supply chain management will be obtainable in four main thing. First main is supplier and inventory management. In this main, the benefits that will facile are it will balance service levels with stocking levels, gain company-wide, real inventory visibility, forecast with accuracy and predictability and also reduce lost sales due to out of stock products. The next main is business management, in this main, it will gain visibility all areas of your company and make faster, better decisions with real time information. The third main is customer satisfaction. For this main, the benefits are improve quality of customer inquiry responses, discover customer insights, preferences and trends and it also will identify most profitable customers. The last main is enable your business growth. Through this main it will integrate seamlessly with best in class technologies, open access to database for desired use and also extend capabilities without major system changes. Lastly, the thing that can be understand clearly is the supply chain acts as the main and important role in the company and some business.

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