



# Optimization of Supply Chain System by Implementing Milk Run Logistics Method -A Review

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**ABSTRACT:** In this emerging competitive environment, the ultimate success of the supermarket business will depend on company's supply chain management ability and time management skills. Since competition is no longer between organizations, but among supply chains systems, effective supply chain system has become a potentially valuable way of improving organizational performance

and securing competitive advantage. With the increasing enterprise resource in the grocery industry is becoming an even more effective tool to help businesses grow. In the future, the most successful businesses in the grocery industry would be those who manage their supply chains the most effectively.

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## 1. INTRODUCTION

A supply chain consists of the whole flow of raw materials, capital, goods, and information to end user from manufacturer and it also includes all parties involved in the process, such as retailers, warehouses, manufacturers, transporters, suppliers, and customers. Customer services, new product development, operations, finance and distribution marketing are also consisted by the concept of supply chain. According to various logistics books the supply chain

processes starts with when a customer places an order for buying product or services and end when satisfied customer has paid for the particular product or service.

## 2. LITERATURE REVIEW

Marcella Anjani (2016) [1] aim was to redesign the supply chain system in an automotive industry in order to obtain space reduction in the inventory by using tailored logistics network. The redesigning process by tailored supply chain will combine all possible shipment methods including direct shipment, milk-run, milk-run via distribution center and Kanban delivery. The



current supply chain system in Nissan goes rather well when the production volume is in moderate level. However, when the production volume is high, there is a capacity problem in the warehouse to accommodate all delivered parts from suppliers. Hence, the optimization of supply chain system is needed in order to obtain efficient logistics process and effective inventory consumption. The study will use primary data for both qualitative and quantitative approach as the research methods. Qualitative data will be collected by conducting interviews with people related to procurement and inventory control. Quantitative data consists of list of suppliers with their condition in several parameters which will be evaluated and analyzed by using scoring method to assign the most suitable transportation network to each supplier for improvement of inventory reduction in a cost efficient manner.

**Sanne Schilder (2014) [2]** studied about the Supply Chain Resilience, increased length and complexity of supply chains; companies nowadays are becoming more vulnerable to supply chain disruptions. Building supply chain resilience helps to reduce the impact of a disruption and provides the ability to recover quickly from a disruption when it does occur. Previous research indicates that there might be an effect between the strength of a buyer supplier relationship and the resilience of the supply chain. However, it is not clear how

relationship strength may help in building resilience. By means of multiple case study research, this is explored in order to generate more in-depth insights. Concluding, stronger relationships lead to more collaboration related to disruptions. This helps to improve visibility, velocity and flexibility and in that way leads to more resilience in the supply chain.

**Björn Ingo Seitz (2013) [3]** find out, if Kverneland should stay with its current setting of sourcing spare parts or if the group should implement the proposed purchasing strategy. The top management of the Kverneland Group, a Norwegian MNC which develops, produces and distributes agricultural machinery, wants to improve the performance of its spare parts supply chain and considers making some adjustments of its current purchasing strategy. In the present setting, all spare parts which are needed at the central warehouse are ordered from the Kverneland factories which developed the machines to which the respective parts belong. However, since most of the spare parts are not manufactured in-house by Kverneland factories but produced externally, the factories usually have to order the required parts from external suppliers on behalf of the warehouse. According to the proposed future purchasing strategy, the warehouse would order the parts directly from the external suppliers and they would also be delivered directly to the warehouse. Against this background, this thesis



analyzes possible consequences of a change from the current to the future setting for the Kverneland Group, the Business Area after Sales and the Kverneland factories. The proposed purchasing strategy would especially affect the administrative ordering and physical order handling activities which are currently executed by the factories on behalf of the warehouse. Furthermore, the future setting would affect the total lead times of spare parts which have a high influence on the stock levels and the capital tied up in inventory at the central warehouse. The main purpose of this study is to find out if Kverneland should stay with its current setting of sourcing spare parts or if the group should implement the proposed purchasing strategy. At the end of this thesis, main conclusions and recommendations are drawn which can be used as guidelines for the implementation of the proposed purchasing strategy. Furthermore, this study discusses which compensation fees the warehouse should pay towards the factories if the future setting would be realized.

**Ramaa.A,K.N.Subramanya,T.M.Rangaswamy**, (2012) [4] carried out to evaluate performance levels and enhance productivity of the manual warehouses. In a supply chain, warehousing function is very critical as it acts as a node in linking the material flows between the supplier and customer. In today's competitive market environment

companies are continuously forced to improve their warehousing operations. Many companies have also customized their value proposition to increase their customer service levels, which has led to changes in the role of warehouses. This paper highlights the findings of the study carried out to evaluate performance levels and enhance productivity of the manual warehouses Background: In extended periods at the end of 2011 Lærdal experienced increasing stock-out situations at the inventory facility in the Netherlands, for subsequent periods they struggled to maintain the inventory at a desirable level. The unexpected increase in demand was due to health workers in Switzerland changed the training procedures to apply the CPR doll 'Little Junior' in favour of the previous used CPR doll. The focus of this thesis is to investigate whether a change in Lærdal's inventory policies and improved information sharing will have a positive effect on decreasing these stock-outs periods in the future, while the costs are kept at a minimum level in order to try to improve Lærdal performance. The results: Quantitative results are obtained based on five Excel models where each is created to show Lærdal with different settings and



strategies. An attempt was made to change Lærdal's current inventory policies in such a way as to improve control of the inventory, in addition to investigating the information shared between Lærdal and customers/suppliers. Both of these areas have been in focus to be able to reduce potential uncertainty in the supply chain and future stock-outs for Lærdal. It was shown that Lærdal could save a total of 7.8 % in total cost and improve the fill rate by 5% if they altered the inventory policies used today. On the other hand it showed that information sharing between Lærdal and the customer would not improve the service level, however holding cost and variability decreased. Main conclusions and recommendations: Based on the results of the created models, the main conclusion in this thesis is to recommend Lærdal to change the inventory policies currently used to potentially reduce the costs and improve the customer service level and create better relationships in the supply chain where information is shared, in order to reduce the existing variability.

**Maren Aareskjold (2012) [5]** Studied of the Effects of Supply Chain Performance through Inventory Policy Improvements and Information Sharing and investigated some

important problems in the supply chain management (SCM) for the process industry to fill the gap in the literature work, covering production planning and scheduling, production, distribution planning under uncertainty, multiobjective supply chain optimisation and water resources management in the water supply chain planning. To solve these problems, models and solution approaches are developed using mathematical programming, especially mixed-integer linear programming (MILP), techniques. First, the medium-term planning of continuous multiproduct plants with sequencedependent changeovers is addressed. An MILP model is developed using Travelling Salesman Problem (TSP) classic formulation. A rolling horizon approach is also proposed for large instances. Compared with several literature models, the proposed models and approaches show significant computational advantage. Then, the short-term scheduling of batch multiproduct plants is considered. TSPbased formulation is adapted to model the sequence-dependent changeovers between product groups. An edible-oil deodoriser case study is investigated.



**Gurinder Singh Brar and Gagan Saini (2011)** [6] reviewed the literature on Milk Run Logistics and to present an overview of its implementation practices adopted by the manufacturing organizations. The paper also discusses milk run logistics in the procurement system with a special emphasis on the automobile industry. Milk run system is all about logistics support for the supply chain. Milk run system results in reduction in cost of transportation, travelling path and fuel consumption. The effects of the direct shipment on the traffic conditions and on the environment have also been studied. By introducing the milk run logistics under heavily congested traffic conditions, the supplier can have full control on the procurement process. Also, the number of trucks on road can be reduced thus resulting in improvement in traffic conditions. The effect of the milk run logistics on the reduction of CO<sub>2</sub> is also discussed. The promotion of Milk Run logistics can be highly evaluated from the viewpoint of environmental policy.

Toshinori Nemoto (2010) [7] revealed that by introducing the Milk Run logistics even under heavily congested traffic conditions, automobile manufacturers can have full control of the procurement process, resulting

in the reduction of the number of trucks dispatched and the improvement of traffic conditions to some extent in urban areas. Recently, Japanese automobile manufacturers are trying to procure parts by the so-called Milk Run logistics at most of their foreign factories even if road traffic conditions are not favorable to perform frequent deliveries. Through a survey of Japanese automobile manufacturers in Thailand, it was revealed that the Milk Run logistics is introduced initially to increase logistics efficiency of companies producing vehicles in the range of several tens of thousands with the intention of increasing truck load factors by consolidating different parts together. Subsequently, the Milk Run logistics is now being operated to achieve more frequent and accurate procurement of small-lot parts, and is synchronized with the manufacturing process to reduce inventories. In the case of the Toyota Samrong Plant, five different Milk Run zones comprising 120 suppliers were established and 600 trucks equipped with GPS devices were being dispatched and monitored in real-time, such that emergency trucks can be dispatched if necessary. On the average, the needed parts are being picked-up four times a day. The study revealed that by



introducing the Milk Run logistics even under heavily congested traffic conditions, automobile manufacturers can have full control of the procurement process, resulting in the reduction of the number of trucks dispatched and the improvement of traffic conditions to some extent in urban areas.

Xiaoqi Li, (2014) [8] reviewed on value stream mapping, especially concerning useful value stream mapping tools and the application of value stream mapping in construction industry. Value stream mapping is a lean manufacturing technique that originated from the Toyota Production System (TPS). It is used to analyze and design the flow of material and information required to bring a product or service to a consumer. This thesis has two main objectives. The first is an in-depth literature review on value stream mapping, especially concerning useful value stream mapping tools and the application of value stream mapping in construction industry. The literature review of value stream mapping provides an overview of this lean tool, which offers a framework for future study in the application of value stream mapping in construction industry. The other objective is to perform a case study of my own experience in doing this research study and

the value stream mapping of my thesis writing process. The value stream mapping process helps visualize the work and target waste, which enables future improvement toward a better state. As a result, the improved value stream maps can be guidelines for future studies.

### 3. CONCLUSION

It can be concluded from the above study that the improvement of the supply chain is very important for the growth of the business and it could be improved by the implementing milk run logistics method and could measure the change in the supply chain of the Ondoor Concept by Value Stream Mapping.

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