



IMPACT OF INDUSTRY 4.0 ON SUPPLY CHAIN MANAGEMENT

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Abstract

Although supply management was emerging rapidly in the decades of 80's and 90's, today in 21st-century which is known as an era of Industry 4.0, industrial firms are still struggling with the concept. Factors like product arrival, customer's feedback & up-gradation competition have led to huge losses are takes place because of the lack of supply chain management.

In today's era, manufacturing has to work with supply chain management. These manufacturing issues cause us to consider the position we have reached in the manufacturing process as well as how well established supply chain management techniques have adapted to changes in the stages of product development, the compression of cycle time, and employee effort to meet demand and meet customer expectations in an era of "Industry 4.0".

Keywords: Manufacturing, Industry 4.0, SCM (Supply chain management).

I. Introduction

Manufacturing is initiated during the industrial revolution in the 19th century. In the early 19th century manufacturing is transferred from job production to mass production. Due to that manufacturing process have a big impact on factors like tools, machines, and transportation.

Manufacturing industries depend on profit and this will depend on customer satisfaction regarding the quality, and the arrival of products with in time.

Businesses require both a strategic strategy and a focus on the competition to flourish in today's fast-paced manufacturing environment.

Types of Production:-

Manufacturing Processes:-

- 1) High Volume
 - a) Quantity Production
 - 1) Manual
 - 2) Automatic
 - b) Flow Line Production



- 3) Continuous Flow Line
- 4) Assembly Lines
- 5) Single
- 6) Model Lines
- 7) Multi/mixed Model Lines
- 8) Transfer Line
- 2) Medium Volume
 - a) Batch Production
 - b) Cellular Production
- 3) Low Volume
 - a) Job Shop
 - b) Project Shop

Quantity production is a type of high volume manufacturing that focuses on making a lot of the same thing with the same standard tools.

The 4th Industrial Revolution also known as Industry 4.0, is the latest technique of organizing and controlling the product life cycle from beginning to end in order to meet the increasingly specific needs of individual consumers.

Revolution	Period	Specialization
1 st Industrial Revolution	1760-1840	Hand production to Machines
2 nd Industrial Revolution	1871-1914	Technological Revolution, Production Line
3 rd Industrial Revolution	Late in 20th century	Digital Revolution
4 th Industrial Revolution	Early 21st century	Automation

Industry 4.0 impacted on operational efficiency, Distinctiveness, Components, Primary drivers.

A product or customer's service is shipped from the product supplier to the customer using a system developed by company/people for activities/information, and resources known as a supply chain. The supply chain involves processes that transform different types of components, raw materials, and natural resources into final finished products that are supplied to customers. The collection of businesses engaged in the many procedures and tasks that result in the value that is then sent to the consumer in the form of goods and services.

The concept was developed and the notion of coordinating the operations of the chain's enterprises was presented in the 1980s. The concepts of merging crucial company operations, concentrating on end-user requirements, and other forms of chain rivalry were developed in the 1990s. Years 2000s, the idea of merging concentrated on the feedbacks of the end users in digital economy.

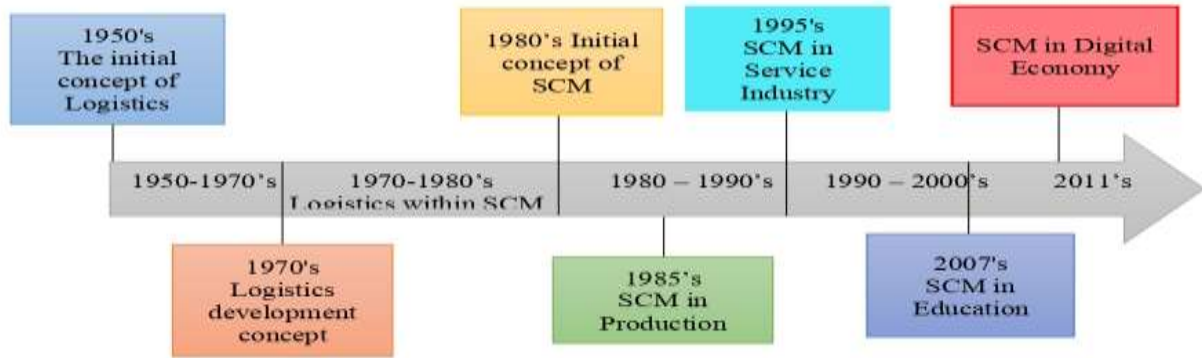


Figure 1 : Developmental timeline of SCM

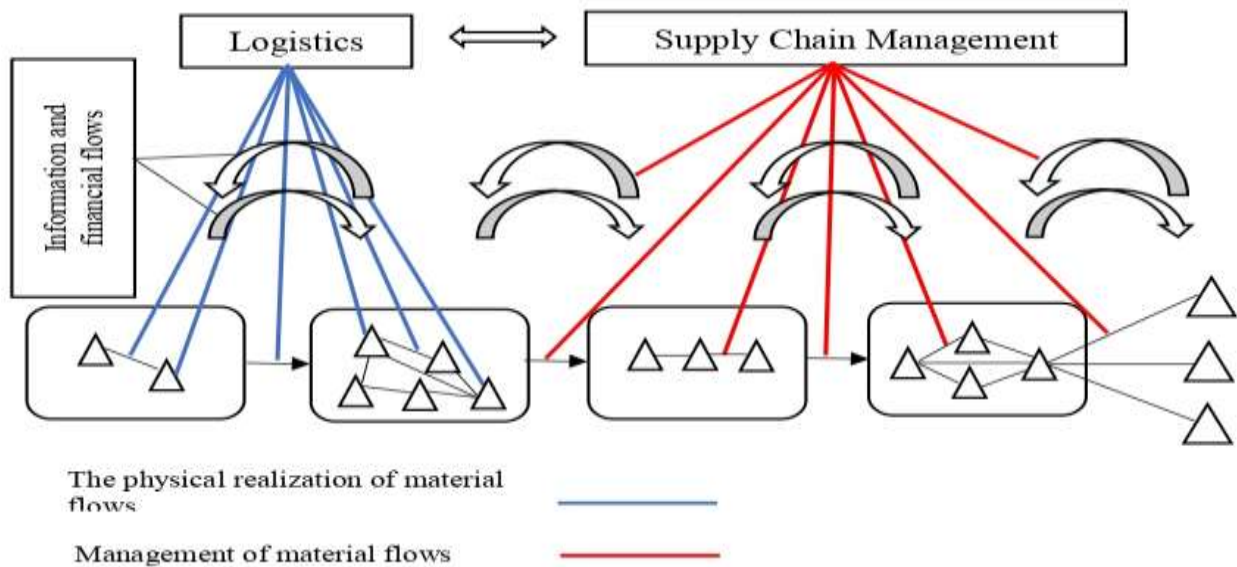


Figure 2 : Logistics and SCM (Ivanov, 2009)

II. Literature

The importance of developing empirical and quantitative studies demonstrating the factor of importance of Industry 4.0 on SCM practices emphasized considering the literature reviewed along with research work conducted in the field of IR 4.0 and zero-defect manufacturing.

At the end becoming or retaining competitiveness in a globally challenging environment, supply chain and SCM are obtaining increased attention. This paper indicates a framework for identifying how traditional systems are differ from SCM systems. [1]

Companies in the food supply chain must collaborate more frequently by a business environment undergoing rapid transformation due to supply chain model as a result of the dynamic demands and constraints imposed. [2]

Numerous companies must act swiftly in response to market shifts in the present day. New product launches pose a threat to long-term inventory investments. Smaller predatory competitors introduce innovative service levels. [3]

This paper looks at a number of important SCM problems which gives a better knowledge of supply chain principles and ideas. A framework describes complex integrated systems and information



technology considering the role of planning and coordination in synchronizing the supply chain. This framework sets up the right structure and controls in the business and other parts of the chain.[4]

This study contributes to the growing research area of knowledge on SCI, which has the extended manufacturer strategies collaboration done with supply chain partners and coordinates the management of intra- and inter-organizational responds in order to increase the flow of goods and services, along with collection of information, necessary funds, and accurate decisions so as to provide the best value to the customer. [5]

This article gave an overview of the research on how to bring together the different stages of making a choice. It is driven by the need for better and more efficient tools for making decisions, which is growing as businesses get bigger and more complicated.[6]

It has been determined that this is the way to improve existing product's quality as per customer's need by replacing manufacturing processes with more efficient technologies that are part of the Industry 4.0 initiative.[7]

The approaches that are now considered to be ultra-modern in CPS (Cyber physical system) is the reason behind this study, which explains how these techniques might help facilitate the construction of smart frameworks to realize the exciting goals of industry 4.0.[8]

In order to offer in-depth insights on the implementation of Industry 4.0 and to suggest a theoretical framework for its operationalization in manufacturing, this study targets an investigation about recent developments in academic research and reports in the fields of smart manufacturing and Industry 4.0. This will be accomplished by employing systems theory as the theoretical foundation and a deductive research approach. The aim to study this paper is a primary level investigation of the topic.[9]

The ability of third-party logistics warehouses to buffer the flow of materials through a supply chain and combine the items sourced from a variety of suppliers, both of which have a makeable bearing on the working capacity of supply chain, is primarily responsible for the surge in popularity of these facilities over the past few years. The paper examines the difficulties associated with warehouse management and draws parallels between these difficulties and the features of production faults that gives a DI approach which is the most suited as solution. [10]

In order to meet the more stringent and consistently shifting requirements of the market, the manufacturing processes of the future will need to be more adaptable. They also need to make greater use of the data collected from the plant, preferably using all of the data collected from the plant as a whole. In order to enhance competitiveness through decisions that are informed and made in a timely manner, less accurate data should be polished into up-to date information for decision making.[11]

III. Conclusion

The primary purpose to study this topic is to conduct a literature review and conduct an analysis of the many fields in which technologies related to Industry 4.0 have been deployed. Old manufacturing and distribution practices delay responses. In addition to lost market share, the true cost of a delayed response is the liability of immovable working capital investments.

The importance of developing empirical and quantitative studies demonstrating the influence of Industry 4.0 on SCM practices and the company's overall performance is emphasized based on the literature review and studies done in the supply chain management and Industry 4.0 fields. By adopting digital, businesses can track things in real time when they are ordered, or may be in transit, or may be in a production house. As the tracking of stock is made possible by fusing IoT software and time to time update from supply chain partners. This improves batch management as well as inventory optimization to provide order accuracy and ETAs (decreasing shortage of stock situations).



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