

## Chapter 32

# Role of Information Technology on Supply Chain Management of Pharmaceutical Industry

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### **ABSTRACT**

*Supply Chain Management SCM is a very critical part of any business. A well-coordinated SCM can improve the efficiency of the business and help in cost reduction. As information technology (IT) is being used widely across all businesses, SCM can benefit to a large extent by the use of IT. This article reviews a number of papers in this field and suggests research gaps for further exploration. The aim of this article is to review the literature on the role of IT on supply chain management (SCM) with special focus on the pharmaceutical industry and suggest possible gaps from the point of view of researchers and practitioners. The article finds that IT has made a significant impact in improving the efficiency of SCM. But its successful implementation and collaboration with other firms is the key to success for an efficient SCM. Within each category, gaps have been identified.*

### **INTRODUCTION**

With the evolution of information technology (IT) and easy access to information sharing, the dynamics of business has changed rapidly over the years and almost exponentially in the last decade. The total number of registered companies in the world increased from 23,595,000 in 1990 to 43,539,000 in 2015 (The World Bank, 2017). Members of Generation Y and Generation Z (Ozkan and Solmaz, 2015) have quickly embraced the changes in technology and use them in their daily life, both for work and home. The concepts of automation and web 4.0 (Aghaei et al., 2012) are slowly paving their way as prospects and are beginning to have an impact in the race for evolution. In this race, where there is growth of industries

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and increase in customer demands, there is immense competition for survival among the industries. In such a competitive environment, a company cannot survive with just a superior product or service. It needs to have an efficient Supply Chain Management (SCM) so that it is able to produce the right kinds of product for the right kind of people and deliver those products at the right time.

Literature reveals that an efficient supply chain can increase the efficiency of the entire organization. Nsamzinshuti and Ndiaye (2014) found that the quality of health care in a hospital can be improved by increasing the efficiency in its supply chain. IT on the other hand has been used in diverse fields like improving greening methods (Jarmoszko et.al., 2013), demand forecasting (Sarhani and Afia 2014) and connectivity or hyper-connectivity (Linke, 2013) in general. Improvement in IT and wide availability and usability of IT products has led to a global, hyper-connected market, of people, goods, ideas and techniques. IT helps to increase the coordination (Ghahremani and Tarokh, 2013) between the different elements involved in any business and reduces the risks involved (Hietajärvi and Karvonen, 2016).

The pharmaceutical industry is very complex and lifesaving drugs become a poison if they are not handled properly. Proper SCM is crucial for retaining the medicinal properties of drugs. Temperature, light, pressure and moisture all effect the molecular structure of a medicine. The popularity of IT in improving business and providing solutions can be used to retain the healthy life of a medicine in its journey from the producer to its end consumer. IT can also be used to check inventory levels and replenish supplies as and when required, automatically. Keeping the right amount of stock is essential in the pharmaceutical supply chain. This paper studies the integration of SCM and IT in the pharmaceutical industry so that the benefits of IT used in other domains of SCM or other businesses can be used meaningfully in the pharmaceutical supply chain.

The published literature in the field of SCM, IT and the pharmaceutical industry has been reviewed and different aspects of innovation, technique, risks, advancements, factors and models have been taken into consideration to form a comprehensive paper focusing on the role of information technology in the supply chain management of the pharmaceutical industry.

The paper has been divided into five sections: the first section provides an insight into the methodology adopted for the research. The second section provides a summary of the literature in the area. The third section discusses the different dynamics of SCM that are affected by the evolution of technology. The fourth section gives insights into the impact of IT and its significant contribution to the dynamics of business. The fifth section provides a brief analysis of the changes that have taken place in the pharmaceutical industry in recent years, and in the sixth section, the effect of IT on SCM in the pharmaceutical industry is analyzed.

## **METHODOLOGY**

Using the key words, “SCM”, “supply chain management”, “information technology”, “IT”, “health-care”, “role of IT”, “SCM of pharmaceutical industry”, “pharmaceutical industry”, “role of IT on SCM” and “role of IT on pharmaceutical industry” in a search of databases such as Google Scholar, EBSCO, Scopus and ScienceDirect, resulted in 190 published papers for review. Only papers pertaining to recent developments in SCM were considered, followed by papers involving developments in IT which affected SCM, and finally papers pertaining to pharma. We reviewed 69 papers on SCM to get insights into the recent practices of SCM, 65 papers on the developments of IT related to SCM, and 48 papers on the

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