

The Role of Information Technology in Supply Chain Management

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INTRODUCTION

Over decades of rapid development of information technology and especially Internet it has become apparent that information technology has been significantly influencing all areas of our life and business (Ayeh, 2008; Nedelko & Cirnu, 2008; Stucky & Weiss, 2008). In terms of its impact on business sphere an important viewpoint is related to the supply chains, which has become in centre of attention in business literature. This is due to the globalization and fact that each organization belongs at least to one, in business practice often more, supply chains or networks (Beamon, 1998; Christopher, 2011; Cooper, Lambert, & Pagh, 1997; Lummus & Vokurka, 1999).

A very basic definition defines supply chain as integrity of all parties involved, directly or indirectly, in fulfilling a customer's needs. The supply chain includes suppliers, manufacturers, customers, distributors, warehouses, retailers (Chopra & Meindl, 2013, p. 13). In short, supply chain encompasses all entities that are involved in flow of raw materials, through production to the end customer. An important aspect of supply chain management is the exchange of information among partners in supply chain, which importantly influence success and agility of the supply chain.

In terms of exchange of information among entities in supply chain, supply chain management solutions, based on modern information technology, are aimed to enhance exchange of information, goods and service, across different entities in supply chain. Different information technology solutions play an important role in supporting supply chain management in today's organizations and its supply chains. In current environment, a vital part of supply chain management is represented with information technology solutions

aiming at supporting customer relationships management, which enable better customer management and enhancement of customer satisfaction.

The main purpose of this article is to examine the role, importance and actual usage of information technology solutions that support supply chain management and in that framework customer relationship management in organizations worldwide, as most frequently emphasized tool that support management of customer relations (I. J. Chen & Popovich, 2003; Rigby & Bilodeau, 2011). Results are reported for selected worldwide regions, like North America, Latin America, Asia Pacific, Europe and case of Slovenia.

Knowing actual state of supply chain management and customer relationship management information technology solutions usage in organizations represents a foundation for future decisions about utilization of these solutions in organizations and by vendors of those solutions. Based on the presented research results the article provides some practical recommendations for organizations as well as for vendors and developers of information technology solutions aimed at supporting supply chain management.

BACKGROUND

There are many possible ways to examine the role of information technology in supply chains (Beamon, 1998; Chopra & Meindl, 2013; Christopher, 2011; Simchi-Levi, Kaminsky, & Simichi-Levi, 2009). In this article we adopted approach that is based on the typical development phases of supply chain. In that framework we outline typical development phases and the role of information technology in each of these phases. Next, in line with aims of our article, we

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put our focus on examination of the role, importance and actual usage of information technology solutions that support supply chain management and customer relationship management in organizations worldwide.

Supply Chain

Supply chain presents ambitious and strategically significant concept, which can be defined as “managing the entire chain of raw material supply, manufacture, assembly and distribution to the end customer” (Christopher, 2011; Heitzer & Render, 2003; Murphy & Wood, 2004). Supply chain is the most developed integrated concept, but by its use, the organization meets some open dilemmas such as: 1) what sort of connections exist among the part of supply chain, 2) what is the role (meaning) of different units (e.g. parts) in the entire supply chain, and 3) how can we optimize the parts of the entirety (to form structure) to reach “optimal results” of common work.

Due to the crucial importance of cooperation and especially information exchange among entities involved in supply chain, information technology plays crucial role since it enhances or facilitates exchange of information among entities in supply chain. In order to emphasize the role of information technology in supply chain, we first outline basic integrated concepts of supply chain that will serve us for presentation of steadily increasing role of information technology, through different phases of supply chain development.

They are many different ways in which the linkage involved in the flow of materials and services can be integrated or grouped together (Heitzer & Render, 2003; Rushton, Oxley, & Croucher, 2001; Slack, Chambers, Johnson, & Betts, 2006). Four main concepts will be presented here. These have focused attention on managing across the traditional functional areas of purchasing operation and physical distribution. They are material management, merchandising and logistics and supply chain management (Blanchard, 2006; Cohen & Roussel, 2004; Daft, 2007).

Materials management: The concept originated from purchasing functions that understood the importance of integrating material flow in its supporting functions, both throughout the business and out to immediate customers. It includes the functions of purchasing, expediting, inventory management, stores management, production planning and control and physical distribution management. At the time of its

inception during the 1970s, material management was seen as reducing “total costs associated with the acquisition and management of materials.” Different stages in the movement of material through a multi-echelon system are typically buffered by inventory. Where material management is not in place as an integration concept, these different stages are often managed by different people, reporting to different senior managers within the organization. The result of this separate functional management of the material flow is often high inventory level. The lead time to move materials through the systems is long, the system is inflexible to change, and the whole material movement is difficult to control. Material management means giving responsibility for whole materials and information flow to one part of organization. It then becomes possible to make improvements which allow the coordination, reduction and even removal to some intermediate inventories. With reduced forecasting, greater accuracy of schedules is possible, bringing about greater planning stability. All this leads to reduced costs, which was the original intention of the concept.

Merchandising: In frame of second concept, in the business practice the purchasing task is frequently combined with the sales and physical distribution task into a role termed merchandising. In line with this, merchandising has responsibility to organize sales to retail customers, to determine the layout of the shop floor, to manage inventory and to manage purchasing activities. This is because retail purchase operations have to be so closely linked to daily sales to ensure the right mixture of goods available for customers to buy at any time.

Logistics: Logistics originated during the Second World War when it related to the movement and coordination of troops, armaments and munitions to the required location. When adopted by the business world as a concept it referred to the movement and coordination of finished products. There are many organizations that have a logistics function which manages the total flow of finished goods downstream from the plant to the customers. Here the term logistic is being used as analogous to what we called earlier “physical distribution management.” However, logistic has more recently been extended to include more of the total flow of materials and information. Some authors adopt a definition of logistics which is identical to that of materials management. But there are some differences between materials management and

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