

# The Role of Emerging Information Technologies for Supporting 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 influenced 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 the center of attention in business literature. This is due to the globalization and the fact that each organization belongs at least to one, in business practice often more, supply chains or networks (Cooper et al., 1997; Beamon, 1998; Lummus & Vokurka, 1999; Christopher, 2011).

A 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 the supply chain, which important influence success and agility of the supply chain.

In terms of the exchange of information and especially collaboration among entities in the supply chain, a plethora of solutions, based on modern information technology, are aimed to

enhance the working of entities in the supply chain and enable better exchange of information, goods, services, and collaboration across different entities in the supply chain. Different information technology solutions play an important role in supporting supply chain management in today's organizations and its supply chains. From the viewpoint of solutions, that are based on information technology, at the pedestal are solutions that support customer relationship management (Chen & Popovich, 2003; Tamosiuniene & Jasilioniene, 2007; Kumar, 2010). Besides, that in a contemporary environment, an important viewpoint for enhancing supply chain management, relates to the utilization of emerging solutions, which can be used in order to improve supply chain management in the future.

The main purpose of this chapter is to examine the role, importance and actual usage of emerging information technology solutions that support and have potential to enhance supply chain management in practice (Chen & Popovich, 2003; Rigby & Bilodeau, 2011). The role of information technology in supply chain management is in this paper discussed through the lenses of several selected emerging management tools, like collaborative innovations, corporate blogs, radio-frequency identification, and shared services centers. For a more comprehensive discussion, results for several selected management tools utilization are reported for selected worldwide regions, like North America, Latin America, Asia Pacific, Europe and

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example two emerging economies from Central and East Europe.

## **BACKGROUND**

There are many possible ways to examine the role of information technology in supply chains (Beamon, 1998; Simchi-Levi et al., 2009; Christopher, 2011; Chopra & Meindl, 2013). In this paper, we adopted an approach that is based on the typical development phases of the 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 the aims of our paper, we 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” (Heitzer & Render, 2003; Murphy & Wood, 2004; Christopher, 2011). The 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 a crucial role since it enhances or facilitates exchange of information among entities in the 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 a presentation of the steadily increasing role of information technology, through different phases of supply chain development.

There are many different ways in which the linkage involved in the flow of materials and services can be integrated or grouped together (Rushton et al., 2001; Heitzer & Render, 2003; Slack et al., 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 (SCM) (Cohen & Roussel, 2004; Blanchard, 2006; Daft, 2007).

During the last twenty years or even broader, more ambitious and strategically significant concept has emerged - SCM. SCM is a broader and a strategically more significant concept which includes the entire SC from the supply of raw material, through manufacture, assembly and distribution to the end customer.

## **The Role of Information Technology in Supply Chains**

In last decade information technology has had significantly influence on business processes throughout the entire supply chain (Gunasekaran & Ngai, 2004; Manthou et al., 2004). A very simple definition of information technology utilized in supply chain defines it as a set of hardware and software that enable entities involved in the supply chain to collect and analyze data and information, that are foundation for their decisions (Chopra & Meindl, 2013, p. 500).

Organizations involved in supply chains use different information technology solutions that are aimed to support either internal processes in organizations or solutions that are designed to support collaboration between entities involved in the entire supply chain (Li et al., 2001; Gunasekaran & Ngai, 2004; Simchi-Levi et al., 2009, p. 407). In the frame of collaboration between the focal organization and other entities in the supply chain, information technology represents

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