Chapter 37
Developing Information Sharing Model Using Cloud Computing and Smart Devices for SMEs Supply Chain:
A Case in Fashion Retail

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ABSTRACT

The mismatch between supply and demand always exists within the supply chain and among retail stores. This situation is even worse for SMEs who work without state-of-the-art technologies, especially in terms of quantitative demand and size distribution in fashion industry. In this paper, we develop a cloud computing and smart device (CCSD) model to address the stochastic deviation between supply and demand. A computational experiment proves that the performance of inventory management in the supply chain and among retail stores can be significantly improved by application of CCSD, irrespective of demand and size distribution. In this paper, we illustrate its benefits for both normal and right-skewed demand distribution. We find that different stages in supply chain can also be coordinated by using the CCSD platform. The results show that using all-channel communication network through CCSD increases the information sharing performance.

INTRODUCTION

Very short life cycle products such as fashion and seasonal products exhibit high demand uncertainty before their launch. Depending upon how the products perform against the original forecast, firms used to incur mismatch costs due to either short supply or surplus supply (Patil et al., 2010). Much research has been done for analyzing the impact of technology on supply chains. Past technologies, such as Point of Sale (POS) system and Electronic Data Interchange (EDI), allow real-time data sharing and greatly improve the supply chain performance (Haddara, 2011). Nowadays, modern technologies like Enterprise Resource Planning (ERP) software provide an even more integrated service than just information sharing. Actually, sharing demand and inventory data can significantly improve the supplier's order quantity decisions and allocation of inventory among the retailers (Haddara, 2011). In particular, the value of information sharing is amplified by the auto-correlated demand (Kale et al., 2010). For instance, concluding from various past studies, it is found that supply chain costs are 2.2% to 12.1% lower on average when there is a full information policy which enables effective information sharing.

However, these technologies are too expensive and complex for SMEs (Wu & Wang, 2006) due to lack of human and financial resource (McAdam, 2002; Achanga et al., 2006) and that hinders the adoption of advanced information technologies in SMEs in the fashion retail industry. In the meantime, without the aid of information technologies, the SMEs keep on using traditional methods in various supply chain activities, like manual input of data in inventory control. As typing errors may occur, this may finally result in over-stocking or under-stocking of different items and a higher logistics cost. International benchmarks suggest that the costs of logistics (warehousing and transportation costs) for a retail chain, as a percentage of the cost of goods sold (COGS), is about 4% or 5%. However, in developing countries, logistics costs as a share of COGS are three to five times higher (Dawer & Nandy, 2010).

To improve inventory management by employing affordable coordination system of the supply chain and resolve resource issues of SMEs to implement advanced information system in fashion retail are proposed in this paper. Efficient data flow management is found to be important for minimizing the uncertainty in supply chain decisions. Fortunately, the emergence of cloud computing and popular smart devices can facilitate enhancement of data flow processes. We develop a cloud computing and smart device (CCSD) model for SMEs for better match of retail supply with customers' demand in terms of quantity and size distribution in fashion industry, so as to enhance information sharing, collaboration and connectivity between different stages in the supply chain.

This paper begins with a literature review of past studies on the relationship between cloud computing, ERP and data flow management in supply chain. Next, the paper continues with explanation of the overall model concept, experimental design and discussions presented and analyzed. Finally, the conclusion part marks the end of the paper.

LITERATURE REVIEW

According to the organization information processing theory, organizations are characterized as systems that possess both need and ability to process information as a means to reduce uncertainty (Bagchi, & Bhattacharya, 2014) such as demand for sizes in fashion retail (Kurz et al, 2015). However, most SMEs cannot afford ERP system to handle the demand uncertainty in each retail shop, they may keep more inventory because they cannot forecast the demand accurately and replenish in shorter lead time since

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