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Developing a Model for Evaluating and Prioritizing Effective Factors on Mobile Supply Chain Management Diffusion

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Abstract

Managers should pay more attention to flexible production systems in order to cope with the challenges posed by factors such as global competition, changing customer demands, increasing market penetration, and rapid technological growth. On the other hand, the development of information and communication technology (ICT) provides significant opportunities for a more effective supply chain management including mobile supply chains. This research is aimed at identifying and prioritizing the factors affecting the diffusion of mobile supply chain management systems in dairy industries. To do this, the effective factors and key performance variables were identified through the reviewing associated literature followed by utilizing the Interpretative Ranking Process (IRP). The Prioritization of the factors was conducted with respect to the performance variables. Applying this method provides the ability to prioritize indicators with respect to variables that are very influential in business based on experts' opinions. The results of this study indicate that having appropriate knowledge, compatibility with existing infrastructure, Privacy of data stored and company revenue have the highest rank in this prioritization.

Keywords: Mobile supply chain, Interpretive Ranking Process (IRP), Dairy industries, Diffusion.

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Introduction

Today, trade is taking place in a complex and competitive global environment, and companies are increasingly exposed to environmental, social and economic outcomes resulting from domestic operations and their suppliers. Increasing the complexity of the supply chain and the evolution of information and communication technology (ICT) create new challenges for CEOs. On the other hand, these developments are able to result in the creation of opportunities to provide new management practices that are more reliable. One of the most important areas facing these challenges is supply chain management (SCM). Supply chain management has been challenged by digitalization and supply chain actors need to take advantage of advanced technologies to gain competitive advantage. For this reason, professional management and relationships between partners in the supply chain are essential. Companies are capable to gain competitive advantage by focusing on supply chain management and reducing costs while at the same time satisfying customers. Internet technology is one of the key technologies that facilitates the implementation of supply chain management (Craighead et al., 2006; Konovalenko and Ludwig, 2019; Hartmann and Moeller, 2014; Diaconu and Alpopi, 2014). Currently, the fourth industrial revolution is taking place toward the formation of a future that is heavily dependent on information and sharing throughout the supply chain (Barata et al., 2018). In the 21st century, competition between firms has become a competition between supply chains. The main objective of supply chain management is to meet customers' demand through the most efficient sources, including distribution capacity, inventory and labor force. Information technology including databases, application software and communication networks have been widely used in supply chain management to improve its performance followed by solving the problem of information sharing and some managerial problems successfully (Wang et al., 2009). As a consequence, it is important to establish continuous relationships with suppliers and create an appropriate system to improve the level of customer service (Car et al., 2014). Among all the potential areas for improvement in supply chain managements, information sharing is of particular importance (Welker et al., 2008). Modern supply chain management is often based on the widespread use of information and communication technology that improves the quality of goods and services, andthe efficiency and coordination of all participants in the supply chain. Indeed, The most obvious advantage of using the sharing of information, modern wireless and cellular technologies in supply chain management is providing a very efficient, fast and accurate tool for collecting and sharing information and data on flow of goods and other important events. These features make it easier to control and monitor work activities, and provides updated information on the status of the process followed by enabling the company to create supply chain networks (Arsovski & Rankovic, 2011). Companies

utilizing analytical instruments and advanced technologies in implementing supply chain processes benefit from several merits: (Auramo et al., 2004; Daghfous and Barkhi, 2009)

- More control over the suppliers and their quality standards due to strong relationships, better coordination and collaboration among supply chain members,
- Developing simple processes, shorter delivery and replacement time, and increased availability and operation of equipment.
- Increasing communication and collaboration among supply chain members has led to improved product / process design,
- Faster customer response and improved delivery performance,
- Improving prediction accuracy, scheduling capability,
- Increasing productivity and better responsiveness to demand fluctuations, and
- Low levels of inventory across the chain and a significant reduction in costs

Obviously, companies need to replace the traditional supply chain with adaptive chain networks where partners simultaneously and accurately know information on purchasing, production, demand, supply, sales and other operational activities. (Yuan et al., 2008). Thus, the mobile supply chain has emerged. The mobile supply chain is defined as a system of suppliers, manufacturers, distributors, retailers and customers that provides financial flows, information, and materials to participants, wherever and whenever, directly based on network environments (Zha et al., 2008). In other words, mobile supply chain management is known as a level that enhances companies' ability to improve production and create competitive advantage. Obviously, the mobile network needs exact information on demand, supply, sales, inventory, transportation, and operational activities (Yuan et al., 2008). Technologies such as Electronic Data Interchange (EDI) and Business to Business (B2B) provide a unified integration of information sharing among members of the supply chain. Mobile technologies such as RFID, Wi-Fi, and Global Positioning Systems (GPS) provide an integrated flow of information between supply chain members at any time. (Felix et al., 2013). These technologies will allow companies to analyze and interpret the results in real time and help companies make better and faster decisions to meet customer needs. It will also help organizations by reducing costs and risks, improve their design and management of supply chains, and enable logistics managers to respond to domestic needs and help change the supply chain environment (Govindan et al., 2018).

Given the need for customer orientation and the importance of the quality of information in the mobile supply chain, organizations need to further integrate the strategies of their supply chain. Meanwhile, the importance of information management is unavoidable due to the competitive nature of logistics activities. Therefore, paying attention to mobile supply chains or transmission systems to gain more products is important to facilitate this

challenge and to stabilize the position of suppliers in the competitive market. On the other hand, the mobile food supply chain is one of the most complex and most important parts of the world's industry. The safety and quality of food has always been a priority (Green, 2010), which is also very important in the dairy industry. Dairy products contain a large number of essential nutrients for the human body and their regular daily consumption is recommended especially for children and infants (Nejatolahi et al., 2014). Iran has about 100 percent self-sufficient production in milk which is why the state and the dairy sector intend to export milk to other countries (Beldman et al., 2017). Despite the importance and necessity of conducting researches to assess the degree of the industrial readiness in the field of electronics, a large number of industries have not addressed some issues such as barriers, constraints and solutions. One of these industries is the dairy industry which has a special sensitivity due to the specific characteristics of the products, the influence of information and communication technology and information readiness. Because of the limited lifetime and the very limited availability of products and the need for specific controls on them, the industry needs to receive, distribute and modify orders in a timely manner. Otherwise they incur costs including overall product expiration date, loss of quality and the creation of a variety of poisonings. Furthermore, some of the corrosive products, due to their particular nature, cannot be recycled, and their waste will cause irreparable damage to the environment. Since the importance of information technology and its enormous impact on enhancing the improvement, ease and speed of advancement of activities in various industries and their survival is not covered by anyone, this research tries to prioritize the most important factors affecting the mobile supply chain of dairy producing companies. Thus, the first step is to identify key performance variables to enhance responsiveness and market competition which leads to reducing inventory and errors, improving scheduling and monitoring, reducing the time period, Developing work space and using machines, reducing the risk of manual data entry at risk, tracking information in real time, and improving customer satisfaction.

On the other hand, information in mobile supply chains instantaneously transmits without time delay. Therefore, instantaneous data diminishes delays in transaction processing and ensures a precise expectation of production demand and improves customer service. Thus, in this research, we first identify the key performance variables affecting the dairy industries and then prioritize the factors affecting the diffusion of mobile supply chain management systems to provide the appropriate framework for policy makers. Consequently, the research objectives are:

- Identification of key performance variables in the area of mobile supply chain management
- Identification of effective factors in the field of diffusion of mobile supply chain management

- Prioritizing the effective factors Affecting diffusion of Mobile Supply Chain Management System according to key performance variables by using Interpretive Ranking Process (IRP)

The rest of the paper, in order to fulfill the research objectives, has been organized as follows: in section 2 a theoretical framework on Mobile Supply Chain Management (MSCM) is followed by a literature review that will be discussed. The Next section describes the proposed methodology i.e. Interpretive Ranking Process (IRP). In section 4 the results based on proposed model will be presented and in the final section, discussion, conclusions and practical and research suggestions are made.

Theoretical framework and literature review

Supply Chain

Supply chain is defined as a system of organizations, individuals, activities, information and resources involved in the transfer of a product or service from the supplier to the customer. Supply chain activities involve the transformation of natural resources, raw materials and components into the final product delivered to the final customer. In other words, the supply chain involves a network of organizations that work through upstream and downstream communications in a variety of processes and deliver value to end-users through products and services. It is actually a collection of companies that transfer materials and a set of three or more entities (organizations or individuals) directly involved in the upstream and downstream flow of products, services, resources, and information from the source directly to the customer (Singh and Verma, 2018). Supply chain management is a series of approaches and methods for effectively integrating suppliers, manufacturers, distributors and customers to improve the long-term performance of individual companies and the entire supply chain in a coherent and high-performing business model (Chopra & Meindl, 2001). Therefore, it can be said that the management of a supply chain involves activities such as providing financial resources, production planning and physical distribution systems supported by the flow of information (Katdix, Kuh, Dmitriyadis, Gonaskaran and Kohajova, 2008, Montser et al., 2001). Supply chain coordination requires the actors in the supply chain sharing information and coordinating decisions for linking related processes (Simatupang et al., 2004). Integrating internal processes with suppliers and customers is the nature of the whole idea behind supply chain management. (Frohlich and Westbrook, 2001). The essence of supply chain management is based on integrated planning and having control over three important dimensions. First, functional integrity involves making decisions about buying, producing, and distributing inside and between the company and its suppliers and customers. The second dimension is the geographic integration of these functions among physical facilities located

on one or more continents. The third dimension is the time integration between strategic, tactical and operational planning. strategic planning and control relates to resource acquisition, while tactical planning and control concentrates on resource allocation and refinement and finally operational planning control relates to business implementation (Shapiro, 2001).

Today's competition forces companies to strongly incorporate with their suppliers and customers to reduce contract time. Companies must re-design their internal process before becoming a continuous supply chain. The information system is the key technology needed to coordinate departments, companies and supply chain management. A company is capable to compete successfully through a precise incorporation of customers with suppliers (Lenny et al., 2006). Widespread use of the Internet and Web-based systems enables organizations to establish a strong and consistent incorporation of customers and suppliers for inventory management, demand forecasting and customer and supplier communication (Frohlich & Westbrook, 2001). Supply chain management measures that have a positive impact on operational performance include JIT Supply, managing and coordinating suppliers, maintaining safe storage and strategic cooperation in the machinery and equipment industry (Lenny Coelh et al., 2007).

Mobile Supply Chain (MSC)

The mobile supply chain is a system of suppliers, manufacturers, retailers and customers that provides information, material, and financial flows to participants anywhere, directly and at any time, based on networked environments (Wang et al. 2009). Mobile Supply Chain Management (MSCM) is recognized as a major source of cost reduction and supply chain performance. In other words, mobile supply chain management involves the use of mobile software and tools to guide the supply chain and ultimately help companies reduce costs, accountability and gain competitive advantage (Eng, 2006).Indeed, it is a kind of mobile commerce that is relatively new and integrates existing information technology systems with the supply chain. Therefore, MSCM is developed by integrating mobile technology with existing information technology systems or replacing wired systems. E-procurement, material control, inventory management, warehousing and logistics, orders planning, sales force and facility management are key issues for mobile supply chain management (Clemens et al., 2012).

Advancements in mobile networks and technologies are factors that impact on the growing popularity of (B2B), (E2B) and (B2E) (Kurbel et al., 2006). On the other hand, the availability of mobile technology provides information processing in remote locations at any time along the supply chain. These technologies enable data collection to be analyzed for customer needs, timelines, and supplier selection and demand forecasting, as well as the

possibility of better sharing of information reducing uncertainty and improvement in Supply chain performance. (Srinivasan et al. 1994; Gunasekaran, A., & Ngai, 2004; Yao et al. 2007; and Levi-Bliech et al., 2018). Nevertheless, the mobile supply chain will only succeed if the supply chain itself is fully and successfully implemented within the organization. In recent years, there has been a steady increase in the use of Internet technology in SCM in the manufacturing industries. The implementation of Internet technologies in supply chains contributes to improving production efficiency. Previous studies have focused on the adoption of EDI, B2B and joint venture technologies, and their impact on business performance (Gunasekaran, A., & Ngai, 2004). Moreover, mobile supply chain management software streamlines the flow of information between various parts work across the supply chain. Therefore, when the product reaches the final consumer in this way, it runs a healthy flow (KURT et al.,2016). Mobile Supply Chain Management offers the mostly tend to use RFID. When implementing mobile-based SCMs, they use mobile technologies such as RFID, GPS, wireless network sensors, personal digital assistants (PDAs), and geographic information systems (GIS).

Mobile Supply Chain Management (SCM) has a huge potential for changing the manufacturing industry and attracted the attention of different manufacturers (Huang et al. 2009). Although the implementation of the mobile SCM involves financial investment by the company, the costs can be offset by improvements in the productivity and quality of the product processes. The wireless networks are able to facilitate automated collection and processing of information instantaneously in production processes, reduce and eliminate errors, reduce decision time, and automate the tedious hand-crafted activities. It is important for manufacturing companies to pay attention to the importance of mobile SCM implementation, including side purchases, sales, and business processes (Zou et al., 2006). The implementation of SCM Mobile is an important research topic that seeks to improve operational efficiency and competitive agility for the long-term survival of manufacturing companies. Understanding the importance of mobile SCM has suggested that the scope of mobile SCM requires more research (Zhu et al., 2006; Eng 2006; Huang et al. 2009; Gunasekaran, A., & Ngai, 2004).

Effective factors on Mobile Supply Chain (MSC) Diffusion

Several studies have been conducted on the diffusion of new technologies since 2001 so that each of them has studied a particular technology and has been presented in its adoption. Zhu et al. (2006) studied e-business and identified factors such as technology integration, size of organization, management barriers, regulations and competition pressure. Wang et al. (2010) have read RFID and pointed to top management support, competitive pressures, and technology complexity. Furthermore, Kuan and Chau (2001) studied EDI, Xu et al. (2004)

concentrated on e-business, Sharma et al. (2007) and Chang (2007) investigated the RFID and electronic signature respectively, and outlined several organizational, environmental and technological factor.

However, Felix et al. (2013) presented a coherent framework for mobile supply chain management diffusion. They provided a comprehensive model by integrating the technology-organization-environment (TOE) and inter-organizational relationships (IOR) framework. The TOE framework identifies three aspects of the organizational context that impacts on technology acceptance. The technology factor describes the organization's internal and external technologies. Organizational factors include organizational features such as domain and management structure. The environmental factor refers to an area in which the organization carries out its business including competitors, industry and government (Chong and Ooi, 2008). Chong et al. (2009) found out in their study of e-commerce acceptance among small and medium-sized enterprises (SMEs) that IORs are capable to determine the decisions to accept e-commerce in the supply chain. Addressing IORs is important when it comes to diffuses for MSCM and includes factors such as trust and information sharing. On the basis, the present study developed a framework for extracting key performance variables and effective factors on diffusion of MSCM, with the template of this research.

Literature Review

In this section, some of the recent related articles in the mobile supply chain will be discussed. A number of articles and backgrounds have examined the components and implementation of mobile SCM elements. Yang et al. (2019) conducted an article about financial risk of the Internet supply chain in China. In the research, the relationship between financial risk management and organizational performance in the financial model was examined and the validity of the supply chain financing decision was analyzed. Furthermore, the Simunic model was used to analyze the risk management correlation model in the Internet supply chain. Levi-Bliech et al. (2018) investigated Mobile Technology and Business Process Performances based on the Collaborative Supply Chain Capabilities as a mediating role in European countries. The developed model has aimed to explain how mobile technology enhances collaboration capabilities and boosts business process efficiency (BPP). Elfirdoussi (2018) has published an article around challenges of using mobile services for supply chain management. In his paper, some general work on the mobile web service with regard to supply chain management were investigated followed by major challenges about supply chain management provided by the m-service. Ma & Xie (2018) conducted a research about the impact of loss sensitivity on a mobile phone supply chain system based on the chaos theory. The article focuses on the stability of a supply chain system based on China's communications and the current state of the mobile industry. Also, they reviewed the influence of decision

maker's sensitivity and the speed of decision-making on supply chain stability. Barata et al. (2018) investigated Mobile Supply Chain Management and introduced some guides for future research. The study has been aimed at identifying ways to explore future trends in mobile phone supply chain management (MSCM) in the advent of industry 4.0. Theresearch has been used to evaluate, classify and analyze current information, identify trends and suggestions for future research. Kalem et al. (2016) wrote an article about Today's and Tomorrow's Mobile Technologies in Supply Chains. The aim of the article was to explain the role of mobile devices, applications and lastly Internet of Things in terms of features of mobile phone supply chain management.

Shi et al. (2016) studied on mobile Internet based construction management. The paper presented a systematic review of the M-Internet based CSCM (construction supply chain management) through descriptive and thematic analysis from the four main databases. The theoretical contribution of the paper was to develop an integrated framework in this field of research. Barata and Cunha (2016) conducted a systematic review process for classifying current knowledge, identifying trends and suggestions for future research on mobile supply chain management. The results showed that management aspects and scope of MSCM are less relevant than technological considerations.

Car et al. (2014) concentrated on hospitality industries and mobile technologies in supply chain process. The paper has been aimed at defining the preconditions and capabilities of mobile phone business integration in supply chain management (SCM) in the guest and hospitality industry through mobile devices and mobile apps. The purpose of the paper was to address the role of mobile applications and their use in SCM and to reflect what mobile technology should offer. Pan et al. (2013) made an article around developing an adoption model to identify critical factors that impact on the intent of companies to adopt mobile phone supply chain systems (MSCMs) in the retail industry in South Korea. The study focuses on inter-organizational dimensions.

Clement et al. (2012) conducted an article about mobile device considerations for supply chain and ERP related systems. The paper examined the history of the use of supply chain management devices and ERP applications through the transition to mobile devices, it also considered dynamism , accessibility, and other factors that affect the use of newer technologies. Arsovski and Rankovic (2011) conducted an article on key technologies and applications in mobile supply chain management. In their research, key mobile and wireless technologies that were used in modern mobile supply chain management were presented. They paid more attention to the development of information technology, the identification of mobile device access and the compatibility of information. Moreover, this study presented the main features and applications of mobile supply chain management.

Dedrick et al. (2011) studied the distribution of value in the mobile phone supply chain in the United States. In the paper, a strategy based on company strategy theories was used to analyze the distribution of value among participants. A new approach is used to measure the value of the three phone models from 2004 to 2008. The analysis shows how this framework can be used to calculate service costs for subsidiary coverage. Wang et al. (2009) conducted a research on mobile agent system for supply chain management. This article first discussed the development of the mobile agent and its application in SCM, and then provided the mobile operating system for SCM for the flower trade in China. Indeed, this article offered a mobile operating system to intelligently process and intelligently handle some of these smart activities. Zha et al. (2008) conducted a research on mobile supply chain management based Ubiquitous network in China. The Mobile Supply Chain Management (MSCM) model and MSCM structure were suggested so that the seller were able to obtain customer orders before processing them and quotes from suppliers before making a decision. They concluded that using MSCM significantly has improved the supply chain efficiency. Yuan et al. (2008) studied on system designs in (MSCM) in China and tried to summarize eight key technologies in the mobile phone supply chain management system., They introduced three functional modules in the mobile phone supply chain management system.

Eng (2006) has published an article about the Challenges of Implementation in MSCM to examine the predicaments of mobile technology success.. Moreover, the implications of mobile technology for a successful MSCM implementation have been addressed by pointing three important SCM domains. Siau and Shen (2002) conducted an article titled around commerce applications in SCM. The article examined the incorporationof mobile commerce and supply chain management and discussed issues such as mobile device constraints, network problems, infrastructure constraints, security concerns, users' lack of trust in mobile apps, usability, user interface, mobile access to databases, operating technologies and mobile business models.

With regard to the researches conducted on MSCM, it can be concluded that scholars concentrated mainly on:

- Financial risks and organizational performance
- Challenges of mobile technology in implementing MSCM in a security way
- Increasing the capabilities and performance of the business process by using mobile technology
- Examining the mobile web service and the industry's position in the stability of the supply chain
- The role of mobile devices and their applications in the supply chain

However, the study of the mobile supply chain in dairy industries cannot be underestimated because of the importance of the health of individuals. Thus, this research tries to identify and prioritize the factors affecting the diffusion of mobile supply chain management systems.

Materials and Methods

At this stage, after determining the research framework, key performance variables and effective factors affecting the Mobile Supply Chain Management System diffusion were identified and selected based on the literature review. In fact, the framework of this research is formed by selecting the most suitable model and applying the Best Fit Framework Synthesis method. Figure (1) shows the research framework.

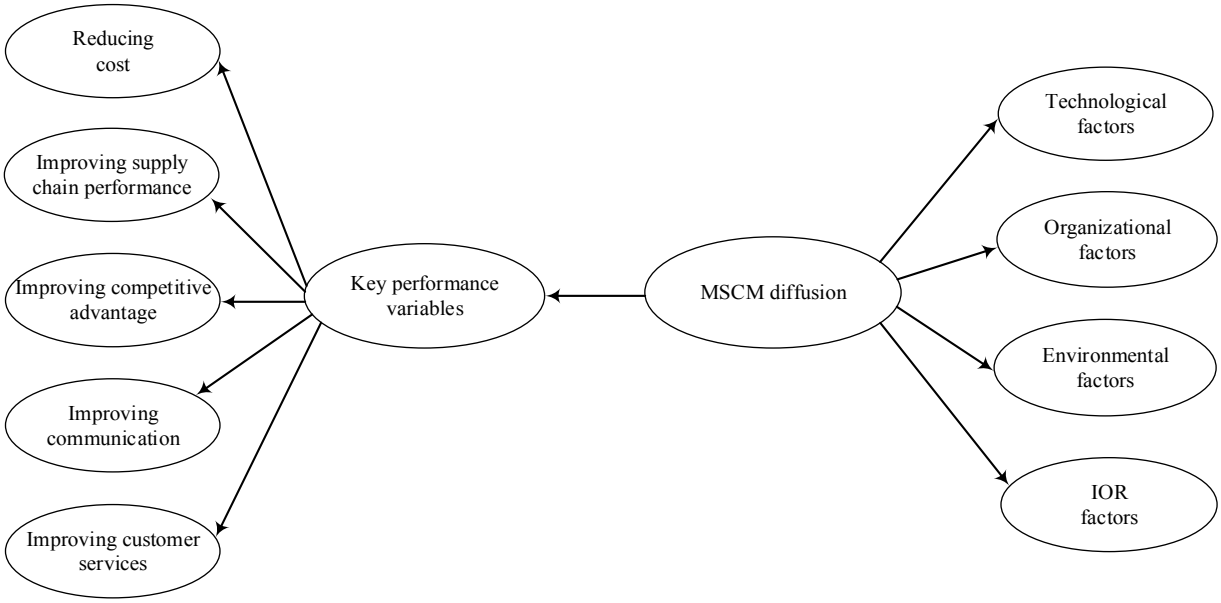

Figure 1. Frame work of key performance variables and effective factors Affecting Mobile Supply Chain Management System in dairy industries

In this regard, this research is an applied research based on the purpose and descriptive-analytic research based on its method. To collect information, a questionnaire tool has been used to explain the interactive relationship between the factors affecting the system's dissemination. Mobile supply chain and its key variables can be used to make an accurate prioritization for the effective variables and ultimately, an appropriate strategy for implementing mobile supply chain in dairy industries. The statistical population of this research includes all experts in the information technology, distribution and marketing of dairy products in three large southern dairy companies (Pegah, Zaringhazal and Arjan). These

experts specialize in information technology and IT management, who are well acquainted with the supply chain and mobility concepts. Table (1) depicts the major characteristics of these companies. The method of sampling for this research was a purposefully selected based on the number of experienced experts in each company. However, the total sample size consisted of eight experts. The data of this research were firstly extracted using the checklist of Content Validity Ratio (CVR) to screen factors. Finally, experts' opinions about the impact of each factor on the key performance variables have been extracted by using the IRP method.

Table 1. Characteristics of Companies studied

Companies	Pegah Fars	Zaringhazal	Arjan
Established year	1964	2006	1976
Capacity (per day)	450	500	500
Products	Milk products, Pasteurized, Sterilized and flavored, Different types of yoghurt, cheeses, creams with different flavors...	Production of more than 60 types of ice cream	A mix of dairy products with a variety of more than 60 items, including milk, yogurt, dough, butter, whey and cheese

Interpretive Ranking Process (IRP)

Interpretive Ranking Process (IRP) is an innovative ranking method that combines an analytical logic of the rational choice process with the strengths of the intuitive process based on the strengths of the pairwise comparison approach proposed by Saaty (1977) which minimizes the volume of cognitive overloads (Sushil, 2009). IRPutilizes an interpretive matrix and interpretive pairwise comparisons as the basic tool, and also overtakes the conventional AHP defect which means the interpretation of expert judgments remains obscure for the researcher. (Haleem et al., 2012). Moreover, the method examines the internal credibility through the logic of the dominance of relationships. The IRP steps are as follows:

Step 1: Identifying two sets of variables; one group that is prioritized according to the other group. Take, for instance, actions and performances, alternatives and criteria, actors and process etc. In this research, effective factors on MSCM diffusion in this research are going to prioritize by key performance variables.

Step 2: Identifying the contextual relationships between these two sets of variables i.e. effective factors and key performance variables.

Step 3: Developing cross-interaction matrix between two sets of variables.

Step 4: Transforming the binary matrix into an interpretive matrix

Step 5: Transforming the interpretive matrix into an interpretvie logic of pairwise comparisons by interpreting the dominance of one interaction over the other.

Step 6: Ranking and interpreting in terms of the number of dominance of number of interactions.

Step 7: Graphic expression of the rankings as an interpretive ranking model.

Step 8: Interpretation of rankings and use of results in order to propose practical actions.

In this study, based on the experts' opinions of the major dairy companies in the south of Iran, the effective factors on MSCM diffusion identified and presented in Tables (2) mainly extracted based on best fit framework synthesis method focused on Felix et al. (2013) followed by considered as measures to meet the key performance variables.

Tables 2. Key performance variables and Effective factors on MSCM diffusion

Reference (functional) variables			
P_1	Reducing costs	P_2	Improving supply chain performance
P_3	Improving competitive advantage	P_4	Improving communication
P_5	Improving customer services		
Effective factors of MSCM diffusion			
I_1	Privacy of data stored	I_2	Security of data transmitted
I_3	Helping quick data capture and analysis	I_4	Compatible with existing IT infrastructure (customer/supplier)
I_5	Efficient way of managing products and services	I_6	Providing accurate information for decision making
I_7	Top management support	I_8	Company capital
I_9	Company revenue	I_{10}	Having appropriate knowledge
I_{11}	Ability to finance	I_{12}	Smoothing business flow
I_{13}	Visibility and transparency of business	I_{14}	Compatible sharing of business operations Information with trading partners
I_{15}	Integrating inventory systems		

Results

The results of this paper are twice. Firstly, it will help dairy companies to be in the best position in the domestic and foreign competitive market. Secondly, it helps other companies to apply this basic principle around the mobile supply chain in order to succeed. These companies can include dairy companies or other companies such as food, vaccine production, etc. In order to utilize IRP it is pivotal to develop a cross-interaction matrix. As noticed before, this matrix shows the relationship between effective factors and key performance variables. Table (3) depicts this concepts based on the opinion of experts so that the number 1 defines the relation and the number 0 defines the absence of a relation. For instance, there is a relationship between P3 and I1 but not between P5 and I2.

Table 3. Cross-interaction matrix among key performance variables and Effective factors on MSCM diffusion

	P_1	P_2	P_3	P_4	P_5
I_1	0	0	1	1	0
I_2	0	1	0	1	0
I_3	0	0	1	0	1
I_4	1	1	0	1	0
I_5	0	0	0	0	1
I_6	0	1	1	0	0
I_7	0	1	0	0	1
I_8	0	0	0	1	1
I_9	0	1	0	1	1
I_{10}	1	1	1	1	1
I_{11}	1	0	0	1	1
I_{12}	0	1	1	0	0
I_{13}	0	1	1	0	0
I_{14}	1	0	0	1	1
I_{15}	1	1	1	0	0

The next step is to provide an interpretive matrix. The matrix of reciprocal relations is transformed into a matrix of interpretive interactions through the description of all the numbers 1 contained in Table (3) in the form of interpretative sentences. For example, (I1, P3) means there is a relationship between Privacy of data stored as an effective factor (I1) and Improving competitive advantage as a key performance variable (P3), so their reciprocal relationship shows that the more confidential information saved, the better competitive advantage gained. Moreover, there is a relationship between providing accurate information for decision making and Improving the supply chain performance, (I6, P2), which means that if managers have more information for decision making, they will perform better. The

interrelationship matrix of the factors affecting the supply chain diffusion and the key performance variables of the mobile supply chain is shown in Table (4).

Table 4. Interpretive matrix among key performance variables and Effective factors of MSCM diffusion

	P_1	P_2	P_3	P_4	P_5
I_1	0	0	Creating a competitive environment through information privacy	Creating a better communication environment by keeping some confidential information	0
I_2	0	Better performance with high-security data transfer	0	Broader communication with higher-security information transfer	0
I_3	0	0	Create a competitive advantage through information analysis	0	Better customer service through ease of analysis of information
I_4	Reduce costs by more adapting to infrastructure	Improved organization performance through infrastructure compatibility	0	Create a secure environment for communication through infrastructure compatibility	0
I_5	0	0	0	0	Enhance customer satisfaction through better customer service tracking
I_6	0	Proper performance by providing accurate decision information	Create a competitive advantage through accurate decision information	0	0
I_7	0	Improved performance through the support of the top Supply Chain Manager	0	0	Better customer service by supporting the top Supply Chain Manager

	P_1	P_2	P_3	P_4	P_5
I_8	0	0	0	Establish a secure communication environment through company capital	Customer service through the company capital
I_9	0	Improve supply chain performance through company revenue	0	Create a secure communication environment through company revenue	Better customer service through company revenue
I_{10}	Reduce costs of the chain through proper knowledge	Improving supply chain performance through adequate knowledge of the organization	Creating competitive advantage through appropriate distribution of knowledge in society	Create a secure communications environment with proper knowledge	The strategy of providing better customer service by creating an appropriate knowledge space
I_{11}	Reduce costs through financing ability	0	0	Effective and useful communication through the ability to finance	Better customer service through company financing
I_{12}	0	Improving supply chain performance by creating market conditions in a smoother way	Creating a better competitive advantage by streamlining business flow	0	0
I_{13}	0	Helps to improve performance by clarifying CEO	Competitive market by clarifying the stages of business and work	0	0
I_{14}	Reduce costs by consulting and teamwork	0	0	Creating more effective customer relationships through teamwork and consulting	Better customer service through increased consultation between partners
I_{15}	Reduce costs through an integrated system	Enhance performance improvement by integrating existing system	Speed up the competitive process by integrating existing systems	0	0

Table 5. Dominating Interactions Matrix – Ranking of effective factors of MSCM diffusion

Dominating		I_1	I_2	I_3	I_4	I_5	I_6	I_7	I_8	I_9	I_{10}	I_{11}	I_{12}	I_{13}	I_{14}	I_{15}
Being dominated	I_1	-	P_3, P_4	P_3, P_4	P_3, P_4	P_3, P_4	P_3	P_3, P_4	P_3, P_4	P_3, P_4	P_3, P_4	P_3, P_4	P_3, P_4	P_3, P_4	P_3, P_4	P3, P_4
	I_2	P_2	-	P_2, P_4	P_2, P_4	P_2, P_4	P_4	P4	P_2	-	P_4	P_2, P_4	P_2, P_4	P_2, P_4	P_2	P_4
	I_3	P_5	P_3	-	P_3, P_5	P_3, P_5	P_3, P_5	P_3, P_5	P_3, P_5	P_3, P_5	P_3, P_5	P_3, P_5	P_3	P_3	P_3, P_5	P_3, P_5
	I_4	P_2, P_1	P_1	P_1, P_2, P_5	-	P_1, P_2, P_4	P_1, P_2, P_4	P_1, P_2, P_4	P_1, P_2, P_4	P_1, P_2, P_4	P_1, P_2, P_4	$P_1, P_2,$	P_1, P_4	P_1, P_2, P_4	P_1, P_2, P_4	P_2, P_4
	I_5	P_5	P5	P2	P5	-	P_5	P_5	P_5	P_5	P_5	P_5	P_5	P_5	P_5	P_5
	I_6	P2	P_3	P_2	P_3	P_2, P_3	-	P_2, P_3	P_2, P_3	P_2, P_3	P_2, P_3	P_2, P_3	P_2, P_3	P_2, P_3	P_2, P_3	P_2, P_3
	I_7	P_2, P_5	P_5	P_4	P_5	P_2	P_5	-	P_1, P_5	P_1, P_5	P_1, P_5	P_1, P_5	P_1, P_5	P_1, P_5	P_1, P_5	P_1, P_5
	I_8	P_5	P_5	P_2, P_4	P_5	P_4	P_4, P_5	P_4	-	P_4, P_5	P_4, P_5	P_4, P_5	P_4, P_5	P_4, P_5	P_4, P_5	P_4, P_5
	I_9	P_2, P_5	P_5	P_1, P_2, P_4	P_5	P_2, P_4	P4, P_5	P_2, P_4	P2	-	P_2, P_3, P_5	P_2, P_3, P_5	$P_2, , P_5$	P_3, P_5	P_2, P_3, P_5	P_2, P_3, P_5
	I_{10}	P_1, P_4, P_5	P_2 P_5	P_1	P_3, P_5	P_1, P_2, P_3, P_4	P_3, P_4, P_5	P_2, P_3, P_4	P_1, P_2, P_3	P_1, P_4	-	P_1, P_2, P_3, P_4, P_5	P_1, P_2, P_3, P_4, P_5	P_1, P_2, P_3, P_4, P_5	P_1, P_2, P_3, P_4, P_5	P_1, P_2, P_3, P_4, P_5
	I_{11}	P_1, P_5	P_5	P_2	P_3	P1, P_4	P_1, P_4	P_4	P1	P_1, P_4	-	-	P_1, P_5	P_1, P_5	P_1, P_5	P_1, P_5
	I_{12}	P_2	P_3	P_2	P3	P_2, P_3	-	P_2, P_3	P_2, P_3	P_3	-	P_2, P_3	-	P_2, P_3	P_2, P_3	P_2, P_3
	I_{13}	P_2	P_3	P_4	P_3	P_2, P_3	-	P_2, P_3	P2, P_3	P2	-	P_2, P_3	-	-	P_2, P_3	P_2, P_3
	I_{14}	P5	P_1, P_5	-	P_1, P_5	P_1, P_4	P_4	P_4	P_1	P_1, P_4	-	P_4	P_4, P_5	P_1	-	P_1, P_5
	I_{15}	P_1	P_1	P_1, P_2	P_1	P_1, P_2, P_3	P_1	P_2, P_3	P_1, P_2, P_3	P_1	-	P_2, P_3	P_1	P_1	P_2	-

The interpretive matrix is utilized to compare effective factors with respect to key performance variables. The Pairwise comparison matrix is driven from the interpretive matrix. It should be noted that in the pairwise comparison matrix, the factors to be ranked are not directly compared. In other words, the relationships between them are compared on the basis of key performance variables. As a result of these comparisons, the dominating interaction matrix is shown in Table (5). If two factors are compared with respect to a performance variable, both of them must be number 1. Therefore, the domination of the two factors in that field of performance is determined according to the experts' comments and the interpretive matrix.

Table 6. Dominance matrix – ranking of effective factors of MSCM diffusion

	I_1	**I_2**	**I_3**	**I_4**	**I_5**	**I_6**	**I_7**	**I_8**	**I_9**	**I_{10}**	**I_{11}**	**I_{12}**	**I_{13}**	**I_{14}**	**I_{15}**	**D**	**D-B**	**Final rank**
I_1	-	2	2	2	2	1	2	2	2	2	2	2	2	2	2	27	7	3
I_2	1	-	2	2	2	1	1	1	0	1	2	2	2	1	1	19	1	6
I_3	1	1	-	2	2	2	2	2	2	2	2	1	1	2	2	24	2	5
I_4	2	1	3	-	3	3	3	3	3	3	2	2	٣	٣	2	36	16	2
I_5	1	1	1	1	-	1	1	1	1	1	1	1	1	1	1	14	-16	14
I_6	1	1	1	1	2	-	2	2	2	2	2	2	2	2	2	24	4	4
I_7	2	1	1	1	1	1	-	2	2	2	2	2	2	2	2	23	-2	7
I_8	1	1	2	1	1	2	1	-	2	2	2	2	2	2	2	23	-3	8
I_9	2	1	3	1	2	2	2	1	-	3	3	2	2	3	3	30	7	3
I_{10}	3	2	1	2	4	3	3	3	2	-	5	5	5	5	5	48	30	1
I_{11}	2	2	2	2	2	2	1	1	2	-	-	2	2	2	2	24	-6	9
I_{12}	1	1	1	1	2	-	2	2	1	-	2	-	2	2	2	19	-7	10
I_{13}	1	1	1	1	2	-	2	2	1	-	2	-	-	2	2	17	-11	12
I_{14}	1	2	-	2	2	1	1	1	2	-	1	2	1	-	2	18	-12	13
I_{15}	1	1	2	1	3	1	2	3	1	-	2	1	1	1	-	20	-10	11

Dominating relations are summarized in the form of a *Dominance* matrix. Each cell in this matrix represents the number of performance variable that an effective factor dominates over another factor or dominated by another factor. Net dominance for a factor is calculated by the D-B where D is the total number of times a factor dominates others and B is the total number of times that the factor is dominated by others. The effective factor with the highest net dominance is ranked first. Table (6) depicts the ranking of all effective factors. As it can

be seen, the first factor for the diffusion of mobile supply chain system is "Having appropriate knowledge ". In today's market conditions, systems must be able to develop an appropriate level of knowledge followed by identifying customer requirements and use it in the mobile supply chain. Furthermore, if the company wants to have the best performance in the mobile supply chain, it must increase the level of knowledge at all levels. The second rank belongs to "Compatibility with existing IT infrastructure". Acceptance of any innovation in the company requires the creation of its own infrastructure. However, these infrastructures impose heavy cost to the company, therefore, considering the market conditions and competitiveness, the Compatibility with existing infrastructures could be successful in the success of the mobile supply chain in dairy companies. The third place for the diffusion of the mobile supply chain system was shared by the "Privacy of data stored" and " Company revenue". In other words, paying attention to company revenue and the privacy of data stored are two essential factors for the success of the mobile supply chain system in dairy products which is mainly because the implementation of the mobile supply chain requires cost and resources. If a company fails to fundraise, it can certainly face major predicaments and even a failure. Moreover, the confidentiality of information and data enables companies to overtake other competitors and to achieve strategic goals. The Fourth rank belongs to "Providing accurate information for decision making". making an important decision such as the implementation of mobile supply chain in dairy products has a high risk and needs to justify CEOs and shareholders in this industry. Therefore, providing accurate information for decision making can help to achieve a real and accurate strategy. And the fifth ranking is "Helping quick data capture and analysis". This is an important factor in providing accurate information for decision making so that the more accurate the data is obtained, the easier it will be to analyze and get the data followed by making decisions better and faster.

The final framework of the mobile supply chain system effective factors for dairy products based on the rankings has been illustrated on Figure (2). This pattern is capable of helping CEOs to make a proper and appropriate decision in creating mobile supply chains in dairy products.

Discussion and Conclusion

This research is an attempt to identify the enablers of mobile supply chain diffusion in dairy industries in Iran to examine the relationships between them and their positions. this research is indeed one of the first to prioritize the effective factors in supply chain performance and diffusion of mobile supply chain system using the IRP method. Thus, the scientific contribution of this research is the introduction of IRP as a method to analyze the behavior of variables and decision-making. Nevertheless, the introduction of the mobile supply chain of dairy products and the analysis of the relations between them in the dairy industry in Iran has

not been studied so far. Furthermore, the strengths of the IRP approach include the lack of need for high proficiency in providing information that can hardly be quantified and interpreted as well as the ease and accuracy of relationships in measuring and comparing impacts. The results of the study of the factors affecting the key performance variables of the mobile supply chain of dairy products showed that proper knowledge for all those involved in diffusion of a mobile supply chain is necessary and the basis of this process is appropriate knowledge. After that, the next important point is to pay attention to the existing infrastructures as much as possible. Finally, in order to reach a mobile supply chain, the Privacy of data stored, company revenue, providing accurate information for decision making, Helping quick data capture and analysis, Security of data transmitted, top management support , company capital and the ability to finance the company should be emphasized.

This study can be compared with Chan and Chongs' (2013) research which examined the effects of technological, organizational, environmental and IOR factors in three stages of mobile signal dissemination and the relationships between evaluation, approval, and rotational stages. It can be argued that technological factors play an important role in the process of approval and prosperity stages and organizational factors have a significant effect on all three stages of mobile signal broadcasting. Environmental factors also have a significant relationship with the adoption stage of the SCM mobile phone and IOR factors affect the stage of the transmission efficiency of mobile signals. Also, top management support for all three stages of signaling is important. Interesting observations of the research are that organizational factors have the highest impact at the approval stages. Elfirdoussi (2018), in addition to examining the industry-leading mobile phone literature, based on the supply chain management approach, has proposed some of the challenges in supply chain management provided by m-service. Some of the challenges are: Mobile web services running on the supply chain need the ability to discover, control, mix, and service quality in a public registry. The implementation of mobile web services requires the availability of information at all stages of the supply chain in real time, and the web service must ensure the quality of service with respect to supply chain management. Pan et al. (2013) in their study developed an adoption model to identify critical factors on the intention of companies to adopt mobile supply chain systems (MSCMs) in the retail industries. It became apparent that supply chain awareness has created interdependencies and inter-organizational trust that positively affects the long-term relationships of companies with their business partners. Organizational pressures, long-term relationships and excellent management also have a significant impact on the goals of MSCM approvals. Eng (2006) puts forward the challenges posed by the implementation of mobile supply chain management. This study examines the features of wireless technology and challenges for MSCM.

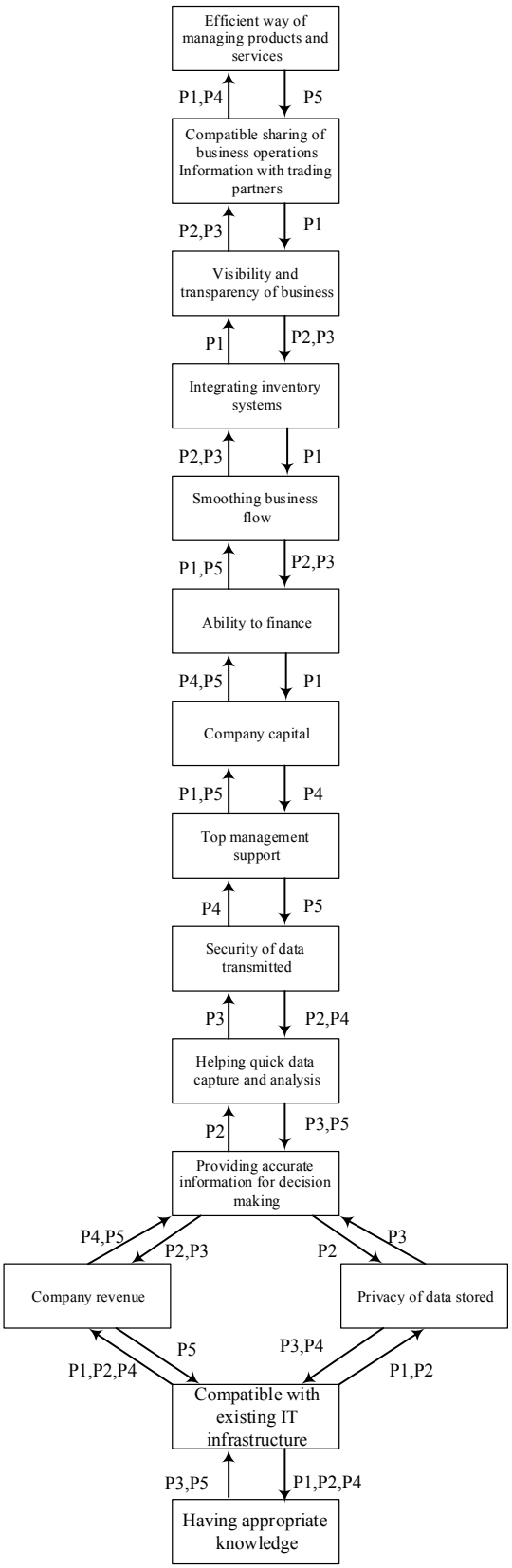

Figure 2. Interpretive ranking model for effective factors

The implications of wireless technology for SCM are examined on three main areas of SCM: (i) competitive advantage based on the concept of value chain analysis in SCM; (ii) relationship management for successful collaboration along the supply chain and strategic partnership; and (iii) Coordination and integration of different functions and activities to improve the overall performance of the supply chain. Felix et al. (2013) also presented a framework that was part of the variables related to the dairy industry in the present study as an effective factors for MSCM diffusion. However, this research merely proposes a conceptual model and it is pivotal to examine and test the model in various industries.

Based on the results of this study, the following suggestions are presented to the policymakers and managers of dairy companies and other related industries: Regarding the prioritization, having sufficient knowledge among suppliers, distributors, and sellers is recommended followed by conducting monthly surveys and advice on appropriate strategies for improving the mobile supply chain system. Moreover, it is suggested that the implementation of the mobile supply chain system in dairy companies is cost effective, and will use the full range of existing infrastructures in order to strengthen their mobile supply chain in an appropriate period. Also, one of the most important priorities of a diffusing mobile supply chain system is providing accurate information for decision making; therefore, collecting the highest and most accurate information for making decision is suggested by using product quality questionnaires monthly.,. For researchers who are interested in research in this field, it is recommended to consider the feasibility of factors affecting the implementation and diffusion of Mobile Supply Chain, use of mixed and statistical methods to prioritize factors in dairy industries and other related companies.

References

Arsovski, Z., & Rankovic, V. (2011). Mobile supply chain management–key technologies and applications. *Center for Quality* .

Atkins, A., Zhang, L., & Yu, H. (2010). *Application of RFID and Mobile technology in Tracking of Equipment for Maintenance in the Mining Industry.* Paper presented at the The Australasian Institute of Mining and Metallurgy.

Auramo, J., Kauremaa, J., & Tanskanen, K. (2004). Benefits of IT in supply chain management–an explorative study of progressive Finnish Companies. *Department of Industrial Engineering & Management, Helsinki University of Technology* .

Barata, J., & Cunha, P. (2016). *Mobile supply chain management: moving where.* Paper presented at the Proceedings of the 13th European, Mediterranean and middle eastern conference on information systems (EMCIS).

Barata, J., Rupino Da Cunha, P., & Stal, J. (2018). Mobile supply chain management in the industry 4.0 era: an annotated bibliography and guide for future research. *Journal of Enterprise Information Management, 31*(1), 173-192 .

Beldman, A., van Berkum, S., Kortstee, H., & Zijlstra, J. (2017). *Dairy farming and dairy industry in Iran*: Wageningen Economic Research.

Car, T., Pilepic, L., & Simunic, M. (2014). Mobile technologies and supply chain management-lessons for the hospitality industry. *Tourism and hospitality management, 20*(2), 207-219 .

Chan, F. T., & Chong, A. Y.-L. (2013). Determinants of mobile supply chain management system diffusion: a structural equation analysis of manufacturing firms. *International Journal of Production Research, 51*(4), 1196-1213 .

Chang, I., 2007. Factors affecting the adoption of electronic signature: Executives' perspective of hospital information department. Decision Support Systems, 44 (1), 350–359.

Chong, A.Y.L. and Ooi, K.B., 2008. Adoption of interorganizational system standards in supply chains: An empirical analysis of RosettaNet standards. Industrial Management & Data Systems, 108 (4), 529–547.

Chopra, S., & Meindl, P. (2001). *Supply Chain Management: Strategy, Planning, and Operation*. Prentice Hall.

Clemens, B., Cata, T., & Hackbarth, G. (2012). Mobile device considerations for supply chain and ERP related systems. *Communications of the IBIMA, 2012*, 1 .

Craighead, C., Patterson, J., Roth, P., & Segars, A. (2006). Enabling the benefits of supply chain management systems: an empirical study of electronic data interchange (EDI) in manufacturing. *International Journal of Production Research, 44*(1), 135-157 .

Daghfous, A., & Barkhi, R. (2009). The strategic management of information technology in UAE hotels: An exploratory study of TQM, SCM, and CRM implementations. *Technovation, 29*(9), 588-595 .

Dedrick, J., Kraemer, K. L., & Linden, G. (2011). The distribution of value in the mobile phone supply chain. *Telecommunications Policy, 35*(6), 505-521.

Diaconu, D. M., & Alpopi, C. (2014). *Strengths and Weaknesses of Current Supply Chain Management and Initiatives for the Future.* Paper presented at the Proceedings of the 8th International Management Conference" Management Challenges For Sustainable Development", November 6th-7th, Bucharest, Romania.

Elfirdoussi, S. (2018). Using mobile service for supply chain management: a survey and challenges. *arXiv preprint arXiv:1807.00617*.

Eng, T.-Y. (2006). Mobile supply chain management: Challenges for implementation. *Technovation, 26*(5-6), 682-686 .

Felix T.S. Chan & Alain Yee-Loong Chong (2013) Determinants of mobile supply chain management system diffusion: a structural equation analysis of manufacturing firms, International Journal of Production Research, 51:4, 1196-1213

Frohlich, M. T., & Westbrook, R. (2001). Arcs of integration: an international study of supply chain strategies. *Journal of operations management, 19*(2), 185-200 .

Govindan, K., Cheng, T., Mishra, N., & Shukla, N. (2018). Big data analytics and application for logistics and supply chain management: Elsevier.

Green, D. P. (2010). Sustainable Food Supply Chains. *Journal of Aquatic Food Product Technology*, 19 (2): 55-56

Gunasekaran, A., & Ngai, E. W. (2004) .Information systems in supply chain integration and management. *European journal of operational research, 159*(2), 269-295 .

Haleem, A., Sushil, Qadri, M. A., & Kumar, S. (2012). Analysis of critical success factors of world-class manufacturing practices: an application of interpretative structural modelling and interpretative ranking process. *Production Planning & Control*, *23*(10-11), 722-734.

Hartmann, J., & Moeller, S. (2014). Chain liability in multitier supply chains? Responsibility attributions for unsustainable supplier behavior. *Journal of operations management, 32*(5), 281-294 .

Huang, G., Wright, P., & Newman, S. T. (2009). Wireless manufacturing: a literature review, recent developments, and case studies. *International Journal of Computer Integrated Manufacturing, 22*(7), 579-594 .

Kalem, G., Kurt, O., Vayvay, Ö., & Şimşit, Kalender, Z. (2016). *Today's and Tomorrow's Mobile Technologies in Supply Chains* (Vol. 13).

Ketikidis, P., Koh, S., Dimitriadis, N., Gunasekaran, A., & Kehajova, M. (2008). The use of information systems for logistics and supply chain management in South East Europe: Current status and future direction. *Omega, 36*(4), 592-599 .

Konovalenko, I., & Ludwig, A. (2019). Event processing in supply chain management–The status quo and research outlook. *Computers in Industry, 105*, 229-249 .

Kurbel, K., Jankowska, A. M., & Nowakowski, K. (2006). A mobile user interface for an ERP system. *Issues in Information Systems, 7*(2), 146-151 .

Kuan, K.K.Y. and Chau, P.Y.K., 2001. A perception-based model for EDI adoption in small businesses using a technology– organization–environment framework. Information & Management, 38 (8), 507–521.

KURT, O., KALEM, G., VAYVAY, Ö., & KALENDER, Z. T. (2016). The Role of Mobile Devices and Applications in Supply Chains. *International Journal of Economics and Management Systems, 1*, 94-103 .

Lenny Koh ,S., Demirbag, M., Bayraktar, E., Tatoglu, E., & Zaim, S. (2007). The impact of supply chain management practices on performance of SMEs. *Industrial Management & Data Systems, 107*(1), 103-124 .

Lenny Koh, S., Saad, S., & Arunachalam, S. (2006). Competing in the 21st century supply chain through supply chain management and enterprise resource planning integration. *International Journal of Physical Distribution & Logistics Management, 36*(6), 455-465 .

Levi-Bliech, M., Naveh, G., Pliskin, N., & Fink, L. (2018) .Mobile Technology and Business Process Performance: The Mediating Role of Collaborative Supply–Chain Capabilities. *Information Systems Management, 35*(4), 308-329 .

Ma, J., & Xie, L. (2018). The impact of loss sensitivity on a mobile phone supply chain system stability based on the chaos theory. *Communications in Nonlinear Science and Numerical Simulation, 55*, 194-205.

Mentzer, J. T., DeWitt, W., Keebler, J. S., Min, S., Nix, N. W., Smith, C. D., & Zacharia, Z. G. (2001). Defining supply chain management. *Journal of Business logistics, 22*(2), 1-25 .

Nejatolahi, M., Mehrjo, F., Sheykhi, A., & Bineshpor, M. (2014). Lead Concentrations in Raw Cows' Milk from Fars Province of Iran. *American Journal of Food and Nutrition, 2*(5), 92-94 .

Pan, Y., Nam, T., Ogara, S., & Lee, S. (2013). Adoption model of mobile-enabled systems in supply chain. *Industrial Management & Data Systems, 113*(2), 171-189 .

Shapiro, J. (2001). Beyond supply chain optimization to enterprise optimization. *Cleveland, OH: SLIM Technologies* .

Sharma, A., Citurs, A., and Konsynski, B., (2007). Strategic and institutional perspectives in the adoption and early integration of radio frequency identification (RFID). In: HICSS ’07 proceedings of the 40th annual Hawaii international conference on system sciences, 3–6 January, Hawaii, USA, IEEE Explore, 1–10.

Shi, Q., Ding, X., Zuo, J., & Zillante, G. (2016). Mobile Internet based construction supply chain management: A critical review. *Automation in Construction, 72*, 143-154.

Siau, K., & Shen, Z. (2002). Mobile commerce applications in supply chain management. *Journal of Internet Commerce, 1*(3), 3-14.

Simatupang, T. M., Victoria Sandroto, I., & Hari Lubis, S. (2004). Supply chain coordination in a fashion firm. *Supply Chain Management: An International Journal, 9*(3), 256-268 .

Singh, D., & Verma, A. (2018). Inventory management in supply chain. *Materials Today: Proceedings, 5*(2), 3867-3872 .

Srinivasan, K., Kekre, S., & Mukhopadhyay, T. (1994). Impact of electronic data interchange technology on JIT shipments. *Management Science, 40*(10), 1291-1304

Sushil, D. (2009). Interpretive Ranking Process. *Global Journal of Flexible Systems Management*, 10(4), 1-10.

Wang, W., Li, T., Zhao, W., & Dai, W. (2009). *Mobile Agent System for Supply Chain Management.* Paper presented at the The 2009 International Symposium Computer Science and Computational Technology (ISCSCT 2009.

Wang, Y.M., Wang, Y.S., and Yang, Y.F., (2010). Understanding the determinants of RFID adoption in the manufacturing industry. Technological Forecasting and Social Change, 77 (5), 803–815.

Welker, G. A., van der Vaart, T., & van Donk, D. P. (2008). The influence of business conditions on supply chain information-sharing mechanisms: a study among supply chain links of SMEs. *International Journal of Production Economics, 113*(2), 706-720 .

Xu, S., Zhu, K., and Gibbs, J., (2004). Global technology, local adoption: a cross-country investigation of Internet adoption by companies in the United States and China. Electronic Markets, 14 (1), 13–24.

Yang, Q., Wang, Y., & Ren, Y. (2019). Research on financial risk management model of internet supply chain based on data science. *Cognitive Systems Research*.

Yao, Y., Palmer, J., & Dresner, M. (2007). An interorganizational perspective on the use of electronically-enabled supply chains. *Decision support systems, 43*(3), 884-896 .

Yuan, Q., Xiaokang, Z., & Qiong, Z. (2008). *Key technology and system design in mobile supply chain management.* Paper presented at the Electronic Commerce and Security, 2008 International Symposium on.

Zha, M., Liu, X., & Zhang, Z. (2008). *Research on mobile supply chain management based ubiquitous network.* Paper presented at the Wireless Communications, Networking and Mobile Computing, 2008. WiCOM'08. 4th International Conference on.

Zhao, W., Wu, H., Dai, W., & Li, X. (2009). *Integration Middleware for Mobile Supply Chain Management.* Paper presented at the Proceedings. The 2009 International Symposium on Computer Science and Computational Technology (ISCSCI 2009).

Zhu, K., Kraemer, K. L., & Xu, S. (2006). The process of innovation assimilation by firms in different countries: a technology diffusion perspective on e-business. *Management Science, 52*(10), 1557-1576 .

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