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RESEARCH ARTICLE **Open Access**

A Model for Identification of Factors Affecting Services Intelligent Supply Chains: A Meta-Synthesis Approach

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Abstract
Intelligence is an essential factor in supply chain. It prepares the ground for effective and timely communication and facilitates information sharing among supply chain components in both production and service sectors. Hence, the present study seeks to identify the components of services intelligent supply chain and categorize them as a comprehensive model by using the meta-synthesis approach. In this research, total of 437 articles in the field of services intelligent supply chain was identified and examined at first step. Articles were in the period of 1980 to 2022. Finally, after evaluation of articles, 53 articles remained. Then, based on the process of the meta-synthesis and the use of coding method, four main fields and a number of subfields were found for the services intelligent supply chain variable. Initial codes introduced in the software for conceptualization and categorization. The main fields of services intelligent supply chain included intelligence dimensions, intelligence conditions, intelligence strategies and intelligence consequences. Each of these main fields has a number of subfields. The result of the study shows that in order to implement the services intelligent supply chain, several dimensions and components are considered, concepts such as real-time online information flow, intelligent fund flow, intelligent services flow, process management and technology infrastructure play an important role. Suggestions are presented in accordance with the comprehensive model identified. Also, the conceptual model designed can be useful as a basis for future research in the direction of practical manual in the effective use of the services intelligent supply chain.

Keywords: Intelligent Supply Chain, Services, Meta-Synthesis Approach

Introduction

An important part of the current world economy is related to the services field, the ratio of which reaches more than seventy percent in some of the top economic powers of the world, and today it has taken a significant share of the income and profits of companies. Accordingly, companies and organizations seek to provide better and differentiated services to their customers in order to gain an advantage in overtaking competitors and increase market share in order to create distinction and attract customer's opinions are used. With the environmental changes around businesses and the advancement of technology and information technology in the upgrading of systems and development in the communication network and the invention of electronic equipment and the development of system capabilities, new dimensions of supply chains have also emerged and fortunately have established a suitable compatibility with new technologies. In recent years, one of the most innovative and evolved

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types of supply chains is known as the intelligent supply chain. This type of supply chain uses technology and machine learning to collect, network, analyze and optimize decisions. Technological and intellectual innovations require a revision of business relation approaches adopted by entities involved in the creation and distribution of tangible and intangible interests. Speed is becoming a key factor in the development of companies in areas such as transformation of the nature of businesses, management of business process, and dynamicity of consumer lifestyle and demands. (Doan et al., 2021) Following the introduction of the concept of supply chain management, most researchers, scholars, and managers realized that proper selection and management of supplier can enhance supply chain competitiveness. (Rabieh et al., 2011) During the recent two decades, the supply chain management is discussed as one of the most important agents in competition and success of organizations and considered by many researches and experts in field of production and operation management. (Tayyaran et al., 2019) Supply chain network integration is essential for optimization and intelligent management of supply chain components. Timely response to diverse customer demands is among major challenges facing today's companies. The diversity of customer demands has dramatically changed market conditions, and has obliged organizations to form highly flexible supply chains. Furthermore, various factors such as geographical scope, diversity, size, and concentration of products and services affect the provision of a powerful product and service portfolio. Therefore, the exploitation of modern technologies and provision of diverse products and services tailored to the needs of customers can help companies achieve a suitable market position and acquire high market share in accordance with their strategies and goals. (Hajipour and Rahbarjo, 2020) What needs to be said about this fact is that Stevens (1989) found that companies that manage their supply chain from a strategic perspective as an independent entity (integrated), and use tools and techniques that respond to market needs will survive. (Iranban, 2019) Major problems of traditional supply chains include quality uncertainty, delivery time, after-sales service, etc. In this regard, adopting IT solutions gives a distinctive competitive personality to companies, institutions, and organizations involved in a supply chain, and thereby improves customer satisfaction. (Ramak, 2012) Nowadays, to meet market demand and the customers' needs, different organizations must establish collaboration with other elements of the supply chain; consequently, the performance of an organization is affected by the activities of other members of the supply chain. (Iranban, 2019) Regarding the dramatic development of the Internet of Things in various areas, optimal use of data requires the use of artificial intelligence capabilities. By integrating these technologies, companies can dynamically reduce their automation costs and improve their overall productivity. (Ghahremani Nahr et al., 2021) Production-oriented supply chain models cannot be used in the service sector; therefore, a suitable conceptual model must be designed for supply chain management in this sector. (Rezaei Pendari and Azar, 2016) The topic of intelligent supply chain is considered a new field in the world and few studies have been done in this field. In addition, in these few studies, only the description and definition of intelligent features have been mentioned, and of course, these studies in the field of intelligent supply chain are limited to the field of production and industry, and often through models and mathematical and computational information. Technological tools, Internet of Things, and cloud computing are trying to solve problems, and in this regard, physical products and goods are usually considered. Therefore, despite the significant share of services in the Gross domestic product (GDP) of countries and the world economy (more than 50%), studies related to this issue have not been conducted for the service sector, and so far no research has been done to provide a model for the services intelligent supply chain.

In the current situation, what factors can encourage service provider organizations to improve the supply chain and in what environment and with what tools and platforms the factors can reach and achieve the goals have not received the attention of domestic and foreign researchers. Considering this, as well as the amount of available data, the variety of requests and dynamic expectations of customers and suppliers, it will not be possible to respond appropriately and timely to the needs of the market and customers with the current methods. Therefore, it is necessary to carry out scientific research to improve and innovate in the field of supply chain and provide a services intelligent supply chain model in order to develop and complete future studies and theoretical frameworks of this concept. With this description, we intend to design the services intelligent supply chain model by meta-synthesis approach and a systematic review of the studies. Based on this, we will seek to identify and extract the most important and key affecting factors in the services intelligent supply chain model.

Literature Review

The term supply chain was first coined by some management consultants in the 1980s. This issue has since shifted the focus of companies from the management of internal business processes to the management of economic entities. In other words, a supply chain network can be defined as an area of business in which different supply Companies work together to obtain common benefits. (Bani fazel et al., 2021) A supply chain is a network of processes performed to provide customers with necessary goods and services. A supply chain includes several suppliers, manufacturers, distributors, wholesalers, and retailers that cooperate closely with each other to satisfy customers. (Kord and Jamshidi, 2016) Considering the inappropriateness of production-oriented supply chain models in the service sector, it is necessary to define the concept of supply chain in the service sector and a conceptual model for service supply chain management. Armisted and Clark (1993) investigated the applicability of the value chain concept in service industries, which should be mentioned as the first attempt to add services to the supply chain concept. Ellram et al. (2004) contributed the most to the service supply chain literature. Based on production-oriented supply chain models, they proposed a general framework and identified the main service processes or functions. (Rezaee Pendari et al., 2015)

The term intelligence was first used in an article by an IBM researcher in 1958. He believed that the means of communication to lead a business requires the existence of an intelligent system. In this regard, business intelligence is interpreted as an umbrella that covers various activities, processes, and technologies for collecting, saving, analyzing, and disseminating information in order to improve decision-making. Ghazanfari et al. (2011), included three managerial, technical and empower system approaches in the definitions of business intelligence. (Rahimi et al., 2022) Torajipour et al. (2021) To investigate the role of artificial intelligence in helping supply chain management, conducted a systematic review of the theoretical foundations of the subject and found that some techniques, including artificial neural networks, fuzzy logic, multi-agent systems, and genetic algorithms in a wider range compared to They have been used with others. They realized that the network-based nature of supply chain management and logistics provides a natural framework for implementing artificial intelligence. For example, a network of suppliers generates large amounts of data and requires agile decision making. Therefore, it is highly recommended to use artificial intelligence tools for big data analysis and decision support systems; Also, supply chain management companies depend on physical and digital networks that must operate in harmony amid high volume, lean asset allocation, thin margins, and time-sensitive deadlines; Therefore, research on interactive decision-

making systems promotes a deeper understanding of AI solutions and, accordingly, improves the capabilities of such solutions. Using such systems, AI will help the industry redefine the way things are done today by moving operations from reactive to proactive, processes from manual to autonomous, services from standardized to personalized, and production planning from predictive to predictive. The use of artificial intelligence leads to problem solving with higher accuracy, more speed and more input. Recent technological advances have shown that artificial intelligence has a wide range of applications by adapting processes in various fields, including supply chain management. In this regard, many companies have turned from remote monitoring to control, optimization and finally advanced systems based on artificial intelligence to improve their performance. Developing the Harvard architecture intelligent supply chain model by Zhou and Xu (2019), a new conceptual model is presented. The model was explained in two dimensions of logistics management and reverse logistics design and internal communication of factors such as suppliers, resources and recycling as a starting point; also, the components of receiving the input signal, detecting the input signal, processing interfering signals and outputting the supply signal are included in the model. Due to the fact that the hardware and software designed in the traditional supply chain system do not have the necessary consistency and are not reliable in the transfer process and lead to a lot of information complexity, therefore, in response to this problem, an intelligent supply chain information system is proposed. It is technology based and focuses on system hardware and software. Compared with the traditional supply chain information system, the experimental results show that the integrated system of hardware and software components is integrated to achieve the maximum information in the shortest time; thus, guidance for the development of smart technology, the design of the supply chain system, and the exchange of organizational information are of particular importance. The conceptual model presented in the review studies of Oh and Jeong (2019), for the intelligent supply chain model, based on the features of communication, cooperation and optimization, emphasizes the characteristics of financial flexibility, structural flexibility and its realization by the components of the supply chain, which includes suppliers, manufacturers, distributors, Retailers, customers, facilitators, machine, product and system, and from the opposite spectrum, ICPT components include Internet of Things, big data analysis, cloud computing, cyber-physical system, 3D printing, smart factory, artificial intelligence, robotics, virtual and augmented reality. Is mentioned. The observations of the study include convergent technologies in industries such as smart factory, smart logistics and smart retail, where all components interact physically and virtually and share their data to meet customer needs, and according to these characteristics, the system should be flexible; It also identifies real-time solutions based on the development of mathematical models, such as determining alternative routes, changing capacity, changing chain members, and controlling supply quantities. Ehsani and Mehrmanesh (2019), the effect of some factors on organizational performance in the supply chain has been examined for design and validate a suitable model for Saipa Company. According to the study, the conceptual model of research based on the relationship between Technological Capability, Innovation Capability, Competitive Advantage and its relation to the Organizational Performance. Yan et al. (2014) developed a process model for intelligent supply chain based on cloud technology. In this model, the existing challenges include supply chain management, information sharing, cooperation and system integration, which has been realized through a case study and the implementation of a prototype, the efficiency and development of the system in the new intelligent supply chain with a flexibility and agility approach in facilitating resources. Sargazi Moghaddam and Shahsavari

(2015), showed that one of the most effective achievements of information technology is to improve the level of business intelligence to provide reliable services, high-quality products and at minimum cost; therefore they suggested that the use of intelligent software agents in supply chain management can improve management in this field. From Markolaee (2019) point of view, an intelligent supply chain is based on three main features: Technology, Integration and Intelligence. Intelligent digital infrastructures are used in almost all countries. Due to the reduced cost of technology and its high reliability, today, all processes and activities can be measured. Information that were previously generated by people are today generated by machines, sensors, Radio Frequency Identification (RFID) tags, actuators, global positioning systems (GPSs), *etc*. This increases the transparency of the supply chain, because more events and evidences are now visible in the supply chain. Future dashboards will present an online overview of the status of resources, applications, inventory, needs, etc. An intelligent supply chain not only connects customers, suppliers, and intelligent systems with each other, but also connects these items with other objects that are monitored throughout the supply chain. Besides presenting a comprehensive view of the entire supply chain, these connections can also create strong interconnections among supply chain components, and thereby facilitate integration of the planning and decision-making processes throughout the supply chain. Intelligent and decision-making systems assess various constraints and options and help managers simulate different actions and outcomes. An intelligent supply chain can learn, make decisions without human involvement, and reconfigure itself when disrupted. This system not only enhances real-time decisions, but also predicts the future.

Given the broad scope of the research literature, the following Table 1

Table **1** a summary of the most relevant studies.

Table 1.
Summary of thematic background of the research

Author/Date	Field	Concepts	Methodology
(Tsiulin et al., 2020)	intelligence	In this research, the tendencies of Blockchain-based applications in the transportation and supply chain industry and their mutual relationships have been investigated and classified, and the results have been collected in three sections, including document workflow management, financial processes, and device connection.	Review
(Chen et al., 2019)	intelligence	This study is about choosing a sustainable supplier for the supply chain in an intelligent way and based on the determination of criteria weights and ranking of suppliers, it has shown the effectiveness and accuracy of the method with other methods.	Applied/ hybrid approach
(Jia et al., 2019)	performance evaluation	Dynamic pricing and market strategy in service supply chain through direct online channels and on product lead time, quality and cost are investigated.	Applied / Quantitative
(Ghadimi et al., 2018)	intelligence	In this research, to choose a sustainable source of intelligence, information technology factors, advancement of information and communication systems, rapid interactions and decision-making, transparency of real-time information and decentralization are emphasized.	Applied / fuzzy theory

Author/Date	Field	Concepts	Methodology
(Garay-Rondero et al., 2020)	IT	In this research, the development and evolution of logistics and supply chain management has been discussed, focusing on digitization, the role of new trends in technology, automation, communication and value chain has been investigated.	Review
(Liu et al., 2019)	coordination	In this research, the theoretical foundations of supply chain management have been examined from two perspectives and behavioral factors, and it refers to focusing on service management, supply management, demand management and integration.	Applied / Quantitative
(Abdul-basset et al., 2018)	intelligence	in order to build a framework for intelligent systems with the topic of Internet of Things and its impact on the supply chain, the challenges of traditional supply chains have been compared, and intelligence, infrastructure, data integration, information, products, processes, Internet and transparency have been emphasized to overcome the problems. Is.	Applied / Quantitative
(Israel et al., 2017)	integrity	The planning method for the integration of service supply chain and intelligent maintenance systems is the subject of this research and it proposes a method whose purpose is integration, intelligence in operational planning to reduce cost and guarantee supply chain service levels.	Applied / Quantitative
(Masoumik et al., 2014)	Structure	This study has been conducted in order to investigate the correct design of the supply chain in the process, implementation and structure and emphasizes on efficiency, innovation and reputation.	Review
(Mohaghghar and Abbasi, 2019)	Services	With the aim of explaining the sustainability model of the banking service supply chain, the main dimensions and components have been identified. The most important components are: social requirements; strengthening the brand; survival of the organization; vision and policies; environmental and structural changes; human resource; flexibility; Economic Development; Improvement and customer satisfaction	Basic/ qualitative
(Mostaghimi et al., 2015)	performance evaluation	In this research, the identification and prioritization of criteria for evaluating the performance of the supply chain has been considered and according to the results, reliability has the highest priority.	Applied/ descriptive

Due to the dispersion, diversity and volume of big data and the need to integrate and accurately analyze information in order to provide optimal service to customers and consumers, the implementation of an intelligent supply chain is very important. Because by the previous methods, it is not possible to implement an effective supply chain in today's era with the current environmental complexities. Therefore, we will focus on identifying the effective agents and designing a model for services intelligent supply chain. Thus, the necessity of using a new approach equipped with high precision and high-speed technology is fully felt. For this purpose and for the integration of information and coordination between suppliers, companies and customers, the intelligent supply chain based on the use of advanced technology and new technologies is very vital. In this regard, on the basis of understanding the needs and online customer's demands, processing and analyzing information in the minimum possible time, it is also considered to receive feedback on how to receive services in order to improve the processes and to supply and transfer to the company's suppliers, online and intelligently.

Research Method

The current research is a qualitative research and in terms of developmental purpose, the research method is descriptive analysis and data collection is from the type of Documentary based research that are collected and analyzed using the meta-synthesis.

Following the literature review, the authors used the meta-synthesis approach to develop a model for services intelligent supply chains. Meta-synthesis is a qualitative approach that synthesizes and compares the results of qualitative studies in a specific scientific field in order to develop new interpretations and theories. In other words, meta-synthesis reshapes the findings of qualitative studies carried out in a particular field. Meta-synthesis is especially useful when the researcher attempts to find a specific concept in the literature and in cases where he/she observes extensive paradigm shifts in the theoretical foundations of a scientific field. Given the diversity of the contexts, concepts, and outcomes of decisions made in the reviewed articles, this approach can be adopted to develop a coherent model. (Mohammadi et al., 2019) The seven-step approach of Sandelowski and Barroso (2007) was adopted to achieve the research objectives. This meta-synthesis approach contributes largely to the integration of qualitative research findings, and facilitates the process of identification, selection, assessment, and combination of preliminary research results. Figure 1 shows various steps of the research approach. (Mohammadi et al., 2019)

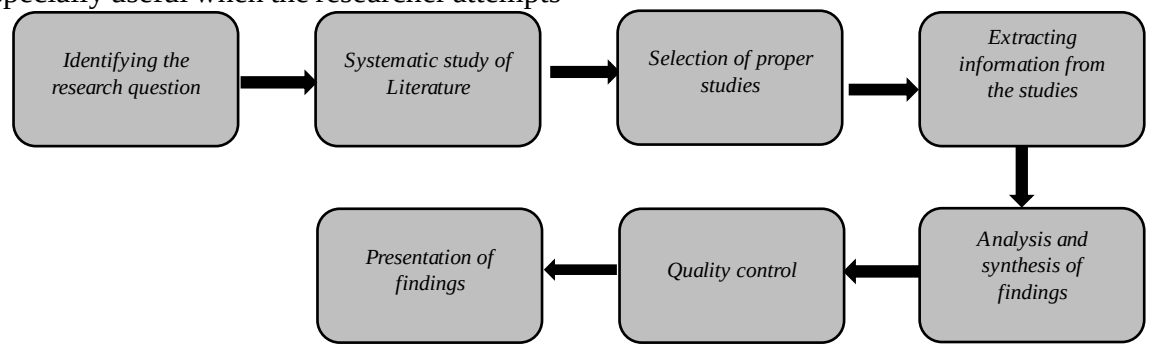

Figure 1. *Seven-step process of Sandelowski and Barroso (2007)*

Step 1: Raising the research question

The first step was to develop the research questions. In this regard, the authors tried to answer four main questions: What are the main research objectives and questions? Who did carry out the research? (The authors answered this question by searching relevant databases) When was the study conducted? (The concept of supply chain was first introduced in 1980; hence, the studies carried out between 1980 until 2022 were reviewed), and how did the authors collect the necessary data (the data collection method). In the present study, the data were collected using documentary method and systematic review. The main research questions are listed in the Table 2.

Table 2.
First step meta-synthesis questions

Parameter	Article Question
What	What are the factors affecting the model of the intelligent service supply chain?
Who	What is the study society to achieve factors?
When	In what period of time were the relevant influencing factors investigated and searched?
How	What method was used to provide the studies?

Parameter	Article Question Answers
What	Identifying factors affecting the intelligent service supply chain through background research
Who	All scientific databases can be cited
When	All research published from 1980 to 2022
How	Document analysis was done by a meta-synthesis approach

Step 2: Reviewing the literature systematically

In this step, all reputable scientific databases such as Google scholar, Emerald insight, ScienceDirect, Magiran, Civilica, SID, and were searched using several keywords related to the research questions. The keywords are presented in Table 3.

Table 3.
Searched Keywords

Keywords
Intelligent supply chain
Services intelligent supply chain
Smart supply chain of services
Services supply chain
Intelligent services

Step 3: Searching and selecting relevant articles

The Critical Appraisal skills program (CASP) was used as selection tools for selected articles. Therefore, the sampling process in meta-synthesis started with higher priority articles and ended with theoretical adequacy. (Rahimian et al., 2019)

In the third step of the meta-synthesis process, reliability was considered as the main selection criterion. To this end, relevant articles were first selected using the aforementioned keywords. These articles were then reviewed to identify the most reliable sources. Then, the titles and abstracts of the selected articles were reviewed. After reviewing the content of the remaining articles, (CASP) tool was used to evaluate the quality of these articles. The main indicators of CASP include 1. Research objectives, 2. Research rational, 3. Research design, 4. Sampling method, 5. Data collection method, 6. Reflexivity (the possibility of generalizing the results), 7. Ethical considerations, 8. Accuracy of data analysis, 9. Clear statement of findings, and 10. Overall value of research. (Bani fazel et al., 2021)

Table 4.
Critical Appraisal Skills Program for evaluate the quality of works

CASP	Weak (0-10)	Moderate (11-20)	Good (21-30)	Very good (31-40)	Great (41-50)
Research objectives					
Research rational					
Research design					
Sampling method					
Data collection method					
Reflexivity					
Ethical considerations					
Accuracy of data analysis					
Clear statement of findings					
Overall value of research					

The CASP scores of all the selected articles were greater than 30.

Table 5 shows the frequency of the selected articles, and Table 6 presents the four articles with the highest CASP scores.

Table 5.
Frequency of points of selected articles

Score	**30-35**	**36-40**	**41-45**	**46-50**
Number	11	17	16	9

Table 2.
List of articles with the highest score

Row	**Article title**	**Score**
1	Digital supply chain model in Industry 4.0 (Garay-Rondero et al., 2020)	48
2	Analysis and application of modern supply chain system in China (Chen et al., 2019)	48
3	Internet of Things (IOT) and its impact on supply chain: A framework for building smart, secure and efficient systems. (Abdul-basset et al., 2018)	48
4	Simulation of the effect of electronic supply chain, including customs, on increasing the level of customer satisfaction with electronic products using Rosetta Net. (Nakhaei and Saei, 2009)	47

Figure 1 depicts the article search and selection process.

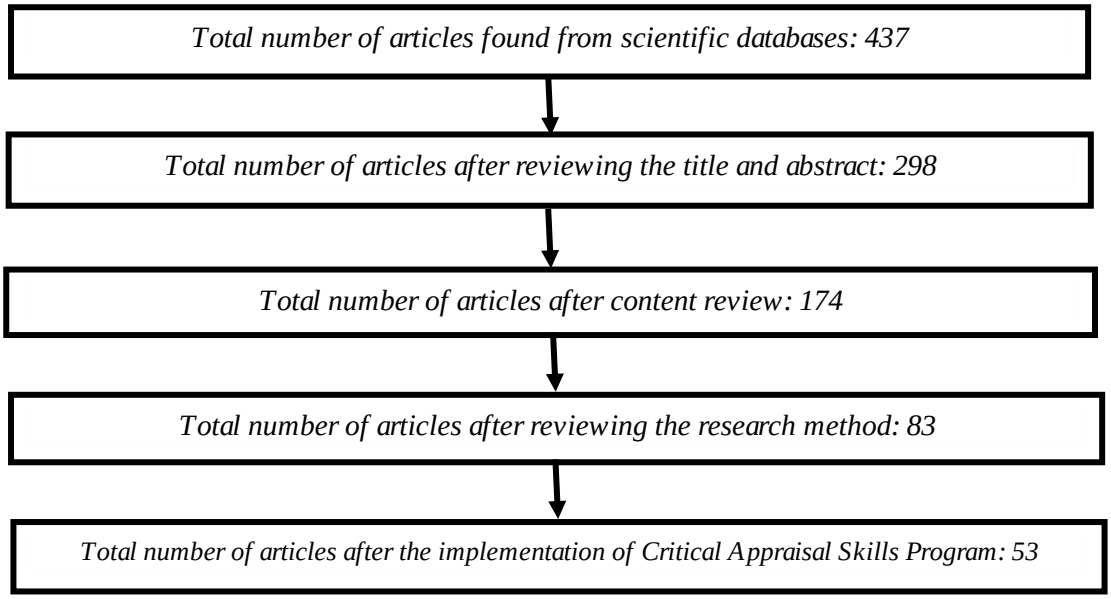

Figure 1. *Study selection algorithm*

Step 4: Extracting relevant data

In this step, the final articles were studied and reviewed using content analysis method. In this method, research sources and documents are analyzed very carefully. Content analysis explores both manifest and hidden content and meaning of texts and documents, and analyzes the relations among variables by adopting systematic and objective approaches. To provide a suitable basis for the next research steps, the content of the selected articles were systematically and carefully combined and interpreted. (Naseri et al., 2017)

Table 7.
Affecting factor on intelligent supply chain of services based on resources

Identified codes	References
Data sharing	(NiliporTabatabaei et al., 2012), (Mir ghafori and Baharestan, 2016), (Regal and pereira, 2018)
Integration	(Gohil and Thakker, 2021)l, (Mehra and Nissen, 1998), (Xie et al., 2020), (Saee Arasi et al., 2019), (Markolaee, 2016), (Dehghani podeh and Pashaee holaso, 2017), (Ghasemieh and Saeedi, 2013)
Big data	(Garay-Rondero et al., 2020), (Rymarczyk, 2020)
capabilities	(Abbasi and Varga, 2021)
chain creation	(Chen et al., 2019), (Ramak, 2012), (Ashori and Tarokh, 2012)
collaboration	(Saee Arasi et al., 2019), (Ramak, 2012), (Farsijani and Fallah Hoseini, 2012), (Sedighpour et al., 2019)
communication	(Ajali et al., 2018), (Gheysari et al., 2013), (Aghaee et al., 2015), (NiliporTabatabaei et al., 2012), (Tizro, 2014), (Teymori, 2002), (Jafar nezhad et al., 2014), (Rajab zadeh et al., 2010), (Sedighpour et al., 2019), (Azar et al., 2012), (Ghazi zadeh et al., 2016), (Mostaghimi et al., 2015), (Gunasekaran et al., 2017), (Abdul-basset et al., 2018), (Oh and Jeong, 2019), (Ma et al., 2020)
connection	(Gohil and Thakker, 2021), (Qiu et al., 2019)
consider variety	(Abbasi and Varga, 2021)
Coordination	(Abbasi and Varga, 2021), (Chen et al., 2019), (Gohil and Thakker, 2021), (Mehra and Nissen, 1998), (Zhong et al., 2017)
cost	(Sunhare et al., 2022), (Qiu et al., 2019), (NiliporTabatabaei et al., 2012), (Dalvi Esfahani et al., 2014), (Tizro, 2014), (Jamali and Fallah, 2017), (Azar et al., 2012), (Ashori and Tarokh, 2012)
Credit management	(Chen et al., 2019), (Xie et al., 2020)
Customer Satisfaction	(Tizro, 2014), (Jamali and Fallah, 2017), (Sadat hasani, 2007), (Mostaghimi et al., 2015), (Salimi zaviyeh, 2018)
data analyze	(Sunhare et al., 2022), (Zhong et al., 2017), (Saee Arasi et al., 2019), (Tizro, 2014), (Ramak, 2012), (Abdul-basset et al., 2018)
Data Collection	(Sunhare et al., 2022), (Zhong et al., 2017), (Dezfoulian and Samouei, 2019)
data mining	(Sunhare et al., 2022)
data sharing	(NiliporTabatabaei et al., 2012), (Jamali and Fallah, 2017), (Hamidi, 2015), (Mir ghafori and Baharestan, 2016), (Regal and pereira, 2018)
decentralization	(Rymarczyk, 2020)
Decision making	(Abbasi and Varga, 2021), (Qiu et al., 2019), (Zhong et al., 2017)
Digitalization	(Garay-Rondero et al., 2020), (Mehra and Nissen, 1998), (Sunhare et al., 2022), (Qiu et al., 2019), (Rymarczyk, 2020)
distribution	(NiliporTabatabaei et al., 2012), (Tizro, 2014), (Hamidi, 2015), (Dezfoulian and Samouei, 2019), (Markolaee, 2016), (Sedighpour et al., 2019), (Mir ghafori and Baharestan, 2016)
E-commerce	(Chen et al., 2019), (Garay-Rondero et al., 2020), (Mehra and Nissen, 1998), (Qiu et al., 2019)
efficiency and productivity	(Gohil and Thakker, 2021), (Qiu et al., 2019)
employment	(Rymarczyk, 2020), (Ajali et al., 2018), (Aghaee et al., 2015), (NiliporTabatabaei et al., 2012)
expert staff	(Dalvi Esfahani et al., 2014)
facilitation	(Mehra and Nissen, 1998), (Saee Arasi et al., 2019), (Tizro, 2014), (Dezfoulian and Samouei, 2019), (Rajab zadeh et al., 2010), (Azar et al., 2012)
feedback	(Abbasi and Varga, 2021)

Identified codes	References
financial resources	(Abbasi and Varga, 2021), (Gohil and Thakker, 2021), (Xie et al., 2020), (Jafar nezhad et al., 2014), (Dezfoulian and Samouei, 2019), (Dehghani podeh and Pashaee holaso, 2017), (Farsijani and Fallah Hoseini, 2012), (Sedighpour et al., 2019), (Gheysari et al., 2013), (Mostaghimi et al., 2015)
flexibility	(Garay-Rondero et al., 2020), (Mehra and Nissen, 1998), (Rymarczyk, 2020), (Marmolejo-Saucedo and Hartmann, 2020), (Gheysari et al., 2013), (NiliporTabatabaei et al., 2012), (Dalvi Esfahani et al., 2014), (Tizro, 2014), (Jamali and Fallah, 2017), (Dehghani podeh and Pashaee holaso, 2017), (Markolaee, 2016), (Farsijani and Fallah Hoseini, 2012), (Sedighpour et al., 2019), (Azar et al., 2012), (Mostaghimi et al., 2015), (Melnyk et al., 2014)
fund flow	(Gohil and Thakker, 2021), (Prause, 2019), (Ma et al., 2020)
good/service flow	(Abbasi and Varga, 2021), (NiliporTabatabaei et al., 2012), (Dalvi Esfahani et al., 2014), (Tizro, 2014), (Jamali and Fallah, 2017), (Rajab zadeh et al., 2010), (Sadat hasani, 2007), (Nakhaei and Saei, 2009), (Farsijani and Fallah Hoseini, 2012), (Ghasemieh and Saeedi, 2013), (Ghazi zadeh et al., 2016), (Melnyk et al., 2014), (Ngai, Peng et al., 2014), (Abdul-basset et al., 2018), (Oh and Jeong, 2019), (Jia et al., 2019), (Sargazi moghaddam and Shahsavari, 2016)
human resources	(Abbasi and Varga, 2021), (Gohil and Thakker, 2021), (Tizro, 2014), (Teymori, 2002), (Hamidi, 2015), (Dezfoulian and Samouei, 2019), (Farsijani and Fallah Hoseini, 2012), (Sedighpour et al., 2019), (Ghasemieh and Saeedi, 2013), (Gunasekaran et al., 2017), (Salimi zaviyeh, 2018), (Ashori and Tarokh, 2012)
information distribution	(Saee Arasi et al., 2019), (Melnyk et al., 2014), (Abdul-basset et al., 2018), (Prause, 2019), (Sargazi moghaddam and Shahsavari, 2016), (Salimi zaviyeh, 2018)
information flow	(Abbasi and Varga, 2021), (Mehra and Nissen, 1998), (Qiu et al., 2019), (Marmolejo-Saucedo and Hartmann, 2020), (Xie et al., 2020), (Oh and Jeong, 2019), (Dezfoulian and Samouei, 2019), (Rajab zadeh et al., 2010), (Salimi zaviyeh, 2018), (Dalvi Esfahani et al., 2014), (Tizro, 2014), (Teymori, 2002), (Jafar nezhad et al., 2012), (Ghasemieh and Saeedi, 2013)
information integration	(Garay-Rondero et al., 2020), (Xie et al., 2020), (Abdul-basset et al., 2018)
integration	(Gohil and Thakker, 2021), (Mehra and Nissen, 1998), (Qiu et al., 2019), (Rymarczyk, 2020), (Marmolejo-Saucedo and Hartmann, 2020), (Xie et al., 2020), (Saee Arasi et al., 2019), (Markolaee, 2016), (Dehghani podeh and Pashaee holaso, 2017), (Ghasemieh and Saeedi, 2013)
intelligent demand	(Garay-Rondero et al., 2020)
intelligent knowledge seeking	(Qiu et al., 2019)
interaction	(Garay-Rondero et al., 2020), (Rymarczyk, 2020)
Investment	(Abbasi and Varga, 2021), (Sunhare et al., 2022), (Qiu et al., 2019), (Rymarczyk, 2020), (Ajali et al., 2018), (Markolaee, 2016), (Rajab zadeh et al., 2010), (Sedighpour et al., 2019), (Ghasemieh and Saeedi, 2013), (Oh and Jeong, 2019), (Veysi, 2004)
learning	(Abbasi and Varga, 2021)
Maintaining all the transactions	(Gohil and Thakker, 2021)
multi-agent application	(Mehra and Nissen, 1998), (Qiu et al., 2019), (Xie et al., 2020)
participation	(Tizro, 2014), (Teymori, 2002), (Dezfoulian and Samouei, 2019), (Dehghani podeh and Pashaee holaso, 2017), (Sedighpour et al., 2019), (Azar et al., 2012), (Ghasemieh and Saeedi, 2013), (Gunasekaran et al., 2017), (Mason and lalwani, 2006), (Ngai et al., 2014), (Oh and Jeong, 2019), (Ashori and Tarokh, 2012), (Veysi, 2004)

Identified codes	References
process management	(Abbasi and Varga, 2021), (Chen et al., 2019), (Garay-Rondero et al., 2020), (Mehra and Nissen, 1998), (Qiu et al., 2019), (Rymarczyk, 2020), (Xie et al., 2020), (Zhong et al., 2017), (Saee Arasi et al., 2019), (Tizro, 2014), (Jafar nezhad et al., 2014)
real-time information	(Gunasekaran et al., 2017), (Ghadimi et al., 2018)
Real-time tracking	(Gohil and Thakker, 2021), (Marmolejo-Saucedo and Hartmann, 2020)
Reported Cases	(Zhong et al., 2017)
resources flow	(Abbasi and Varga, 2021)
responsiveness	(Mehra and Nissen, 1998)
save time	(Dezfoulian and Samouei, 2019), (Sadat hasani, 2007), (Farsijani and Fallah Hoseini, 2012), (Sargazi moghaddam and Shahsavari, 2016)
scheduling	(Mehra and Nissen, 1998)
service delivery	(Abbasi and Varga, 2021), (Garay-Rondero et al., 2020), (Mason and lalwani, 2006), (Abdul-basset et al., 2018), (Ashori and Tarokh, 2012), (Jamali and Fallah, 2017), (Ghasemieh and Saeedi, 2013), (Mostaghimi et al., 2015), (Regal and pereira, 2018)
Supplier management	(Chen et al., 2019), (Gohil and Thakker, 2021)
suppliers coordinating	(Gohil and Thakker, 2021), (Garay-Rondero et al., 2020)
Supply chain finance	(Chen et al., 2019), (Xie et al., 2020)
system	(Abbasi and Varga, 2021), (Garay-Rondero et al., 2020), (Rymarczyk, 2020)
Technology	(Chen et al., 2019), (Garay-Rondero et al., 2020), (Mehra and Nissen, 1998), (Sunhare et al., 2022), (Qiu et al., 2019), (Rymarczyk, 2020), (Xie et al., 2020), (Saee Arasi et al., 2019), (Gheysari et al., 2013), (Aghaee et al., 2015), (NiliporTabatabaei et al., 2012), (Jamali and Fallah, 2017), (Farsijani and Fallah Hoseini, 2012), (Abdul-basset et al., 2018), (Ma et al.2020), (Sargazi moghaddam and Shahsavari, 2016), (Salimi zaviyeh, 2018)
Technology finance	(Chen et al., 2019)
Thrift	(Gheysari et al., 2013), (Markolaee, 2016), (Aghaee et al., 2015), (Ghazi zadeh et al., 2016), (Mostaghimi et al., 2015), (Prause, 2019), (Regal and pereira, 2018), (Zubair khan et al., 2010)
Tracking of product	(Chen et al., 2019), (Gohil and Thakker, 2021), (Rymarczyk, 2020), (Zhong et al., 2017)
transparency	(Rymarczyk, 2020)
update	(Abbasi and Varga, 2021)
virtual value	(Abbasi and Varga, 2021), (Garay-Rondero et al., 2020), (Sunhare et al., 2022), (Xie et al., 2020), (Saee Arasi et al., 2019), (Teymori, 2002)
visibility	(Gohil and Thakker, 2021)

After extracting core categories and concepts from the articles, duplicate items and overlapping codes were omitted.

Step 5: Analyzing and synthesizing qualitative findings

In this step, the authors conducted an in-depth review of the literature to determine several concepts and categorize the findings. Similar categories were defined to reflect the meaning of the concepts. As mentioned earlier, unique codes were assigned to the data, and similar codes were classified into the same

category. Due to the similarity of concepts of the data, descriptive analysis was performed at this stage. In the next step, a new code was assigned to each subgroup based on the pattern analysis. (Bani fazel et al., 2021)

The classification of codes and factors affecting intelligent supply chains in the service sector is presented in the Table 8.

Table 8.
List of selected codes, theme and factors

Factors	Theme (Axial codes)	Final codes
Intelligence Dimensions	Real-time online information flow	information flow Real-time tracking, information integration Real-time tracking
	Communication	Connection Maintaining all the transactions interaction communication
	Fund flow	resources flow financial resources Technology finance Supply chain finance Credit management fund flow
	Flexibility	Flexibility
	Comprehensive resource sharing integration	data sharing integration multi-agent application suppliers coordinating transparency
	Intelligent service flow	Tracking of product/services good/service flow
Intelligence Conditions	Investment	Investment
	Technology infrastructure	Technology System Digitalization
	Human resources	human resources employment expert staff
Intelligence Strategies	Process management	process management decision-making efficiency and productivity
	Information distribution	information distribution updating visibility intelligent knowledge seeking decentralization distribution
	Data collection and processing	Feedback Learning Big data data collection data analyze data mining Reported Cases

Factors	Theme (Axial codes)	Final codes
	Inter-organizational collaboration promotion	Coordination Supplier management collaboration
	Virtual value chain creation	virtual value chain creation
Intelligence Consequences	Customer Satisfaction	Customer Satisfaction Responsiveness intelligent demand consider variety
	Thrift	Cost Thrift save time
	Participation promotion	Capabilities Scheduling participation
	Service delivery facilitation	service delivery E-commerce Facilitation

Step 6: Evaluating the quality of findings

Quality control is a crucially important part of meta-synthesis approach. The authors used inter-coder reliability (ICR) to assess the reliability of the findings. ICR is calculated by dividing the number of codes that all coders agreed on by the men number of codes generated by each coder. In this study, ICR was calculated as 94%, which is greater than the acceptable value of 90%.

Table 9.
Assess the reliability

Coded items	Total number	Number of agreements	Percentage of agreement
Articles	18	17	94

Step 7: Presenting the findings

This section presented the findings of the previous steps. In this study, a total of 53 articles were selected and relevant concepts and variables were then extracted and coded. Finally, the identified variables were assigned to intelligence dimensions, intelligence strategies, intelligence conditions, and intelligence outcomes.

Data Analysis

Tables 10 to 13 show the frequency of the final codes selected for the core categories based on their components.

Table 10.
Final codes of intelligence dimensions

Factors	Axial codes	Code frequency
intelligence dimensions	Real-time online information flow	22
	Intelligent fund flow	19
	Communication	22
	Comprehensive resource sharing integration	21
	Intelligent service flow	21
	Flexibility	17

Table 11.
Final codes of intelligence conditions

Factors	Axial codes	Code frequency
intelligence conditions	Investment	11
	Technology infrastructure	25
	Human resources	18

Table 12.
Final codes of intelligence strategies

Factors	Axial codes	Code frequency
intelligence strategies	Process management	16
	Intelligent distribution	17
	Data collection and processing	15
	Inter-organizational collaboration promotion	11
	Virtual value chain creation	9

Table 13.
Final codes of intelligence consequences

Factors	Axial codes	Code frequency
intelligence Consequences	Customer Satisfaction	8
	Participation promotion	15
	Thrift	20
	Service delivery facilitation	19

Finally, the conceptual research model was designed based on the identified variables, concepts, and categories.

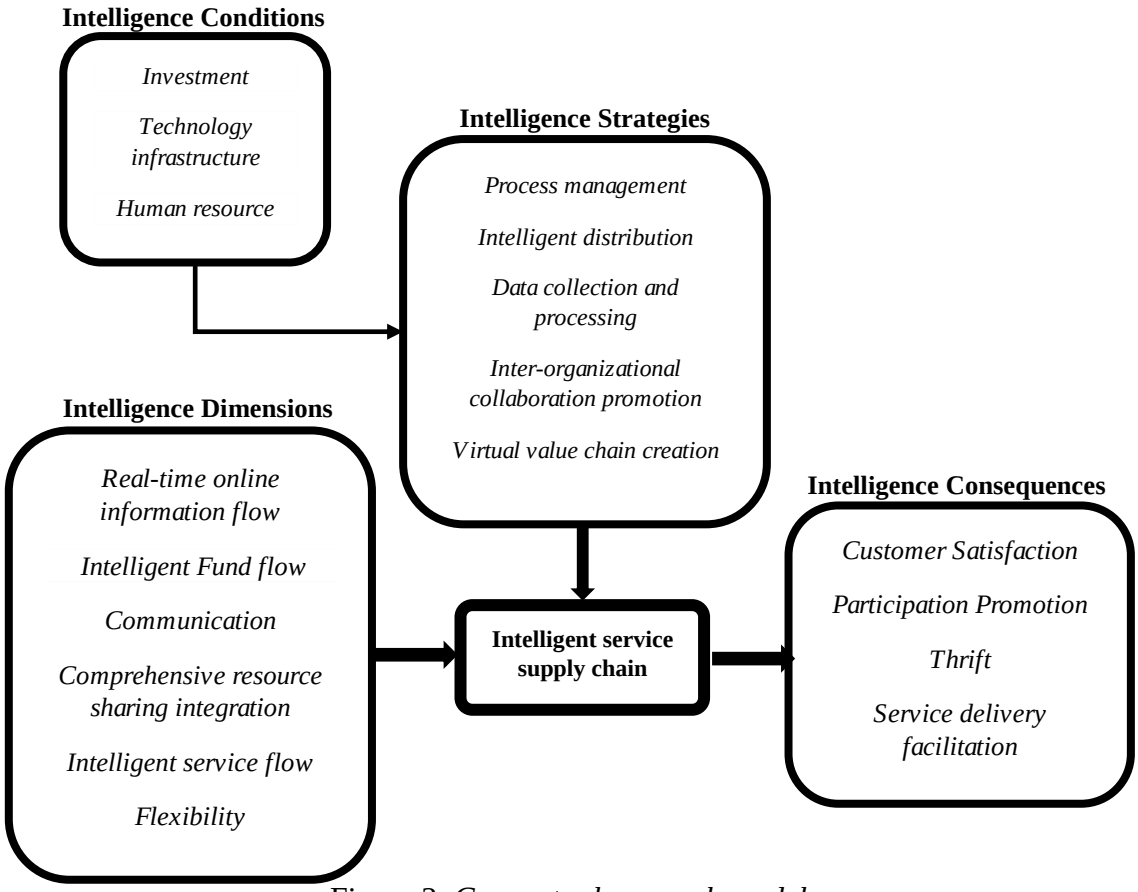

Figure 2. *Conceptual research model*

Conclusion and Suggestions

Conclusion

Considering the importance of Intelligence in supply chain, this study seeks to identify and classify the components of affecting factors in from of a comprehensive model. By reviewing the literature on the subject, it was found that there was no consensus regarding providing a comprehensive model and identifying its components for the services intelligent supply

chain, and only a few researchers have expressed the features and specifications of supply chain intelligence. Thus, in this study, the services intelligent supply chain indexes have been investigated by using the meta-synthesis method and the indexing method. Finally, 53 papers of from 437 articles identified and accepted by using the meta-synthesis approach and the open coding method and in the evaluation process. The 18 unique codes were classified into the following categories: intelligence dimensions including (real-time online information flow, intelligent fund flow, communication, comprehensive resource sharing integration, intelligent service flow and flexibility) The factors of this class are usually consistent with many variables of other types of supply chains, and its difference is defined in the speed of action and high accuracy in decision-making by artificial intelligence and machines, intelligence conditions (investment, human resources, and Technology infrastructure) The implementation of the services intelligent supply chain requires investment in the field of human resources and technological equipment, which is very similar to the electronic supply chain, intelligence strategies (process management, intelligent distribution, data collection and processing, inter-organizational collaboration promotion, and virtual value chain creation) The most important difference between the intelligent supply chain and its other types is in the analysis and use of machine intelligence in improving the cooperation performance of the chain members, and intelligence Consequences (customer satisfaction, thrift, participation promotion, and service delivery facilitation) The implementation of a service intelligent supply chain, has led to customer satisfaction and reduced costs, but it also makes it faster and easier to receive orders and provide customized services to customers. According to a comprehensive presentation model, real-time online information flow and communication in the first category, investment issues in the second category, intelligent distribution in the third category and thrift in the fourth category had the most frequent code in the selected articles and considered to be relatively the most important subfields. The main innovation of this article was the identification of the main dimensions and components of services intelligent supply chain. Another innovation of this research was the use of indexing method. The simultaneous use of indexing method, along with the meta-synthesis method, in addition to the secondary data relating to the meta-synthesis studies, could also produce the initial data or a new subfield, and add it to the model. Therefore, understanding and analyzing the comprehensive models proposed in this study, along with the consideration of regional, indigenous, and other environmental, organizational and human constraints, can direct managers and other decision makers in order to make optimal and appropriate decisions for the organization. It will also help the researchers to use the results of this research in other areas of research. The main innovation of this article was the identification of the components and dimensions and providing the service supply chain model, which has been done for the first time. Another innovation of the study was the using meta-synthesis approach in services intelligent supply chain and use of indexing method. In addition, paying attention to the dimensions and components emerging from the comprehensive model proposed by this research and using it in organizations and service companies along with the consideration of structural differences and the type of industry, in turn, can coordinate supply chain members and decision-making by managers and Facilitate decision makers to make optimal and strategic decisions of the organization.

Suggestions

From a theoretical point of view, the present study examined the supply chain literature, and identified intelligent components of service supply chains; hence, it contributed to the expansion of management knowledge. Researchers are suggested to perform

quantitative tests on the proposed conceptual model, and to assess service businesses (e.g. financial and banking institutions and insurance companies) using the proposed model in order to evaluate the findings and increase the generalizability of the results. Researchers can also examine intelligent supply chain activities in future studies. In this context, the following are suggested to supply chain managers:

1. Based on the dimensions obtained from the research conceptual model, special attention should be paid to the category of intelligent information flow and intelligent fund flow and information technology in the planning and implementation of programs and activities. With the explanation that in the process of Intellectualization, due to the volume (big data), diversity and dispersion of data and information received from different organizations and the need to integrate information, it is necessary to use the power of systems and machines that have the ability to learn and by providing feedback to coordinate and schedule, manage resources on the electronic platform.
2. The provision of human and technological platforms and infrastructures and the use of new technologies for the implementation of the intelligent supply chain of services requires appropriate investment; therefore, the appropriate amount should be allocated in the annual budgets for purchasing and upgrading the necessary hardware and software of organizations and companies.

References

Abbasi, M., & Varga, A. (2021). Steering supply chains from a complex systems perspective. *European Journal of Management Studies*. doi:10.1108/EJMS-04-2021-0030

Abdul-basset, m., Monogaran, G., & Mohamed, M. (2018). Internet of things(IOT) and its impact on supply chain: A framework for building smart, secure and efficient systems. *Future generation computer systems*, 1-15. doi:10.1016/j.future.2018.04.051

Aghaee, A., Salehi Sedghiani, J., Ghorbani zadeh, V., & Mikaeeli, F. (2015). Designing the pattern of lean supply chain using structural equation technique. *Industrial Management Studies, 13*(36), 95-113. (in persian) Retrieved from https://jims.atu.ac.ir/article_1122.html?lang=en

Ajali, M., Mozaffari, M., & Asghari Sarem, A. (2018). Prioritization of key factors in the use of information technology in humanitarian supply chain management with SWARA technique. *Logistics Thought Scientific Publication, 17*(64), 87-102. (in persian) Retrieved from http://lot.jrl.police.ir/article_19098.html?lang=en

Ashori, M., & Tarokh, M. (2012). The Intelligent Web: Tools for Tacit Knowledge Production and Sharing. *Supply Chain Manegement, 14*(37), 60-69. (in persian) Retrieved from https://scmj.ihu.ac.ir/article_203491.html?lang=en

Azar, A., Ali mohammadlo, M., Moghbel ba arz, A., & Ahmadi, P. (2012). Framework for Measurement of Quality of Service in Supply Chains. *Industerial Manegement Perspective, 2*(2), 9-24. (in persian) Retrieved from https://jimp.sbu.ac.ir/article_87341.html?lang=en

Bani fazel, s., Babaee zakliki, m., & hosein zadeh shahri, m. (2021). Presenting a pattern for agile supply chain by meta synthesis approach. *Modern Researches in Desicion Marketing, 6*(2), 156-179. (in persian) doi:20.1001.1.24766291.1400.6.2.7.7

Chen, L., Lu, Y., & Zhao, R. (2019). Analysis and application of modern supply chain system in China. *Modern Supply Chain Research and Applications, 1*(2), 109-119. doi:10.1108/MSCRA-01-2019-0004

Dalvi Esfahani, M., Gorbani, H., & Bagheri GalehSalimi, M. (2014). The Study of Effect Marketing Strategies Alignment on Supply Chain and Organizational Performance (Case: Entekhab Industrial Group). *Marketing management, 9*(23), 95-110. (in persian) Retrieved from https://jomm.srbiau.ac.ir/article_2894.html?lang=en

Dehghani podeh, H., & Pashaee holaso, A. (2017). Provide an interpretive structural model for achieving supply chain quality management in knowledge-based defense companies. *Quarterly Journal of Interdisciplinary Studies on Strategic Knowledge, 27*(27), 7-36. (in persian) Retrieved from https://smsnds.sndu.ac.ir/article_8.html

Dezfoulian, H., & Samouei, P. (2019). The optimal network design for knowledge sharing in a supply chain for horizontal integration. *Journal of Business Administration Researches, 11*(22), 101-128. (in persian) doi: 20.1001.1.2645386.1398.11.22.5.7

Doan, K., Carrino, S., Ivanova, N. V., & Evtodieva, T. E. (2021). Digital Economy and Intelligent Supply Chain Management: International Experience. *Current Achievements, Challenges and Digital Chances of Knowledge Based Economy, 133*, 743-751. doi:10.1007/978-3-030-47458-4_86

Ehsani, A., & Mehrmanesh, H. (2020). A conceptual Model for Evaluation the Impact Factors Affecting Organizational Performance in Supply Chain. *Journal of System Management, 6*(4), 269-294. doi:10.30495/jsm.2021.1919526.1425

Farsijani, H., & Fallah Hoseini, A. (2012). Identify and prioritize the effective factors in achieving world-class supply chain management and provide appropriate solutions. *Industerial manegement Perspective, 2*(2), 25-44. (in persian) Retrieved from https://jimp.sbu.ac.ir/article_87342.html?lang=en

Garay-Rondero, C. L., Martinez-Flores, J. L., Smith, N. R., Caballero Morales, S. O., & Aldrette-Malacara, A. (2020). Digital supply chain model in Industry 4.0. *Journal of Manufacturing Technology Management, 31*(5), 887-933. doi:10.1108/JMTM-08-2018-0280

Ghadimi, p., wang, c., lim, m. K., & heavy, c. (2018). Intelligent sustainable supplier selection using multi-agent technology: theory. *Computers & Industrial Engineering, 127*, 588-600. doi:10.1016/j.cie.2018.10.050

Ghahremani Nahr, J., Nozari, H., & Sadeghi, M. (2021). Green supply chain based on artificial intelligence of things (AIoT). *International Journal of Innovation in Management, Economics and Social Sciences, 1*(2), 56-63. doi:10.52547/ijimes.1.2.56

Ghasemieh, R., & Saeedi, F. (2013). Business Process Reengineering: A Review on Important Methods and Recent Models. *Supply chain management, 14*(38), 44-53.(in persian) Retrieved from https://scmj.ihu.ac.ir/article_203496.html?lang=en

Ghazi zadeh, M., Safari, S., Noroz zadeh, F., & Heydari, G. (2016). Integration of supply chain management approaches in the form of LARG supply chain using Multi Attribute Decision Making Techniques in Saipa company. *Journal of Executive Management, 7*(14), 113-134. (in persian) Retrieved from http://jem.journals.umz.ac.ir/article_1174.html?lang=en

Gheysari, M., Taj far, A., Vahdat, D., & Hoseini, S. (2013). Applying Internet of Thing Technology in Supply Chain Management Based on Cloud Computing. *Supply chain management, 15*(42), 26-41. (in persian) Retrieved from https://scmj.ihu.ac.ir/article_203519.html?lang=en

Gohil, D., & Thakker, S. V. (2021). Blockchain-integrated technologies for solving supply chain challenges. *Modern Supply Chain Research and Applications, 3*(2), 78-97. doi:10.1108/MSCRA-10-2020-0028

Gunasekaran, a., subramanian, n., & rahman, s. (2017). Improving supply chain performance through management capabilities. *Production Planning & Control The Management of Operations, 28*(8), 473-477. doi:10.1080/09537287.2017.1309680

Hajipour, V., & Rahbarjo, M. (2020). Cloud Computing-Based Supply Chain Network Design. *Journal of Industrial Engineering Research in Production Systems, 7*(14), 127-145. (in persian) doi:10.22084/ier.2019.16231.1763

Hamidi, H. (2015). Provide a structure for multifunctional systems in electronic health supply chain management. *17*(50), 22-39. (in persian) Retrieved from https://scmj.ihu.ac.ir/article_203577.html

Iranban, S. (2019). The Effect of Supply Chain Integration on Operational Efficiency and Value Creation. *Journal of System Management, 5*(2), 107-132. Retrieved from https://sjsm.shiraz.iau.ir/article_664754.html

Israel, e. f., albert, a., frazzon, e. m., & hellingrath, b. (2017). operational supply chain planning method for integrating spare parts supply chains and intelligent maintenance systems. *science direct, 50*(1), 12428-12433. doi:10.1016/j.ifacol.2017.08.2432

Jafar nezhad, A., Mohseni, M., & Abdullahi, A. (2014). Proposing a Hybrid Fuzzy PROMETHEE - AHP Approach to Performance Evaluation of Service Supply Chain (Case Study: Hotel industry). *Industerial manegement Perspective, 4*(2), 69-92. (in persian) Retrieved

from https://jimp.sbu.ac.ir/article_87286.html?lang=en

Jamali, G., & Fallah, M. (2017). Agility of the Supply Chain in the Businesses that Technically Support the Iranian Oil and Petrochemical Industries. *Journal of Business Administration Researches, 9*(17), 31-53. (in persian) doi:10.29252/bar.9.17.31

Jia, j., chen, s., & li, z. (2019). dynamic pricing and time-to-market strategy in a service supply chain with. *computers&industrial engineering, 127*, 901-913. doi:10.1016/j.cie.2018.11.032

Kord, B., & Jamshidi, M. (2016). *Supply Chain Management.* Zahedan: Sistan and Balochestan. (in persian)

Liu, W., Wang, D., Long, S., Shen, X., & Shi, V. (2019). Services supply chain management: a behavioral operations perspective. *Modern Supply Chain Research and Application, 1*(1), 28-53. doi:10.1108/MSCRA-01-2019-0003

Ma, H. L., Wang, Z. X., & Chan, F. T. (2020). How important are supply chain collaborative factors in supply chain finance? A view of financial service providers in China. *International Journal of Production Economics*(219), 341-346. doi:10.1016/j.ijpe.2019.07.002

Markolaee, S. (2016). Supply chain Intelligence, Next Generation of Supply chain. *First International Conference on Business and Organizational Intelligence 2016.* Tehran: Shahid beheshti University. (in persian) Retrieved from https://civilica.com/doc/499971/

Marmolejo-Saucedo, J. A., & Hartmann, S. (2020). Trends in digitization of the supply chain: A brief literature review. *EAI Endorsed Transactions on Energy Web, 7*(29), 1-7. doi:10.4108/eai.13-7-2018.164113

Mason, r., & lalwani, c. (2006). Transport integration tools for supply chain management. *International Journal of Logistics: Research and applications, 9*(1), 57-74. doi:10.1080/13675560500534599

Masoumik, S., Abdul-rashid, S. H., Olugu, E. U., & Ghazilla, R. A. (2014). Sustainable supply chain design: a configurational approach. *The scientific word journal*, 1-16. doi:10.1155/2014/897121

Mehra, A., & Nissen, M. (1998). intelligent supply chain agents using ADE. *Proceedings of the Artificial Intelligence and Manufacturing Workshop*, 112-119. Retrieved from https://www.aaai.org/Papers/SIGMAN/1998/SIGMAN98-016.pdf

Melnyk, s. A., narasimhan, r., & decampos, h. A. (2014). Supply chain design: issues, challenges. *International Journal of Production Research, 52*(7), 1887-1896. doi:10.1080/00207543.2013.787175

Mir ghafori, S., & Baharestan, O. (2016). Investigating the Impact of Information Technology and Knowledge Management on Supply Chain Agility. *Supply chain management, 18*(52), 45-59. (in persian) Retrieved from https://scmj.ihu.ac.ir/article_203594.html

Mohaghghar, A., & Abbasi, H. (2019). Designing and Explaining the Sustainability Model for Banking Supply Chain (A Case Study of Mellat Bank). *Management Researches in Iran, 23*(3), 53-73. (in persian) Retrieved from https://mri.modares.ac.ir/article_502.html?lang=en

Mohammadi, G., Sajjadi, S., & Sakhdari, K. (2019). Entrepreneurial Decision-Making Model: A Meta-Synthesis Approach. *Industrial management perspective, 9*(3), 87-108. (in persian) doi:10.52547/jimp.9.3.87

Mortazavi, A., Arshadi Khamseh, A., & Azimi, P. (2015). Designing of an intelligent self-adaptive model for supply chain ordering management system. *Engineering Applications of Artificial Intelligence, 37*, 207-220. doi:10.1016/j.engappai.2014.09.004

Mostaghimi, M., Ramezanian, M., & Esmaeel Zadeh, M. (2015). Identifying and prioritizing measures for evaluating the performance of services supply chain. *Industerial Manegement Journal, 7*(1), 151-174. (in persian) doi:10.22059/imj.2015.52515

Nakhaei, I., & Saei, a. (2009). Simulation of the Impact of E-global Supply Chain Including Customs, to Enhance the Level of Customers Satisfaction of Electronic Products by Means of Rosettanet. *Iranian journal of trade studies, 13*(52), 163-185. (in persian) Retrieved from http://pajooheshnameh.itsr.ir/article_13784.html?lang=en

Naseri, Z., Norozi, A., Fahim nia, F., & Manian, A. (2017). Content Marketing: Identifying the basic components and dimensions in order to provide a conceptual model. *Theoretical and applied research in information science and*

epistemology, *7*(1), 280-303. (in persian) doi:10.22067/44681

Ngai, E. W., Peng, S., alexander, p., & moon, k. K. (2014). Decision support and intelligent systems in the textile and apparel supply chain: an academic review of research articles. *Expert Systems with Applications*, *41*(1), 81-91. doi:10.1016/j.eswa.2013.07.013

NiliporTabatabaei, A., Khayyambashi, B., Karbasian, M., & Shariati, M. (2012). Optimizing the Usage of Information Technology in Supply Chain Management and Marketing of Aviation Products by AHP Approach. *New Marketing Research Journal*, *2*(2), 143-164. (in persian) Retrieved from https://nmrj.ui.ac.ir/article_17597.html?lang=en

Oh, J., & Jeong, B. (2019). Tactical supply planning in smart manufacturing supply chain. *Robotics and Computer Integrated Manufacturing*, *55*, 217-233. doi:10.1016/j.rcim.2018.04.003

Prause, G. (2019). Smart Contracts for Smart Supply Chains. *ScienceDirect*, *52*(13), 2501-2506. doi:10.1016/j.ifacol.2019.11.582

Qiu, L., Zhao, Y., Liu, Q., Sun, B., & Wu, X. (2019). Intelligent transaction: definition, modes, and research directions. *International Journal of Crowd Science*, 36-48. doi:10.1108/IJCS-08-2018-0017

Rabieh, M., Azar, A., Modarres Yazdi, M., & Fetanat Fard Haghighi, M. (2011). Designing a Multi-Objective Resource-Based Mathematical Modeling: An Approach to Supply Chain Risk Reduction (Case Study: Iran Khodro Supply Chain). *Industrial Management Perspective*, *1*(1), 57-77. (in persian) Retrieved from https://jimp.sbu.ac.ir/article_87378.html?lang=en

Rahimi, f., baghalinejad shooshtari, M. h., & nadaf, m. (2022). Designing a Business Intelligence Model Using Grounded Theory Approach. *Quarterly Journal of BI Management Studies*, *9*(34), 247-272. (in persian) doi:10.22054/IMS.2020.53545.1760

Rahimian, M., Namamian, F., Maroofi, F., & Moradi, A. (2019). Identifying and Ranking the Components and Dimensions of E-Commerce Using the Meta-Synthesis Approach. *Journal of System Management*, *5*(3), 159-178. doi:20.1001.1.23222301.2019.5.3.10.5

Rajab zadeh, A., Hasan zadeh, A., Nalchigar, N., & Nalchigar, S. (2010). Proposing a Model to present Factors which Affect e-SCM Risk and their Impacts on Organizational Performance. *Journal of Information Technology Management*, *2*(4), 59-78. (in persian) Retrieved from https://jitm.ut.ac.ir/article_20910.html

Ramak, m. (2012). Provide a model to improve the quality level of supply chain management. *Supply chain management*, *16*(36), 38-49. (in persian) Retrieved from https://scmj.ihu.ac.ir/issue_2200729_2200731.html?lang=en

Regal, t., & pereira, c. e. (2018). Ontology for Conceptual Modelling of Intelligent Maintenance Systems and Spare parts supply chain integration. *sciencedirect*, *51*(11), 1511-1516. doi:10.1016/j.ifacol.2018.08.285

Rezaee Pendari, A., Azar, A., Taghavi, A., & Moghbel ba arz, A. (2015). Provide a model for evaluating the performance of the service supply chain with fuzzy cognitive maps approach(case study: insurance industry). *The Journal of Industerial management perspective*, *16*, 75-93. (in persian) Retrieved from https://jimp.sbu.ac.ir/article_87272.html?lang=en

Rezaei Pendari, A., & Azar, A. (2016). Designing Service Supply Chains Management Model by Grounded Theory. *Public management Researches*, *11*(39), 5-32.(in persian) doi:10.22111/jmr.2018.4009

Rymarczyk, J. (2020). Technologies, Opportunities and Challenges of the Industrial Revolution 4.0: Theoretical Considerations. *Entrepreneurial Business and Economics Review*, *8*(1), 185-198. doi:10.15678/EBER.2020.080110

Sadat hasani, E. (2007). An Analysis of the Virtual Supply Chain in E-Commerce. *Commercial Surveys*(24), 109-114. (in persian) Retrieved from http://ensani.ir/fa/article/journal-number/14602/

Saee Arasi, A., Ziapour Sahi, A., & Khosravi, M. (2019, October 17). *Investigating intelligent supply chain management in the context of e-government.* (in persian) Retrieved from systemyar: https://systemyar.com

Salimi zaviyeh, S. (2018). Investigating the relationship between cyber supply chain management risks and electronic supply chain management risks by confirmatory factor analysis and structural equation modeling (Case study: Daru Pakhsh Company). *Supply chain Management*, *19*(57), 62-75. (in persian) Retrieved from

https://scmj.ihu.ac.ir/article_204678.html?lang=en

Sargazi moghaddam, h., & Shahsavari, M. (2016). An overview of the role of intelligent software agents in supply chain management. *Supply chain management, 18*(53), 14-26. (in persian) Retrieved from https://scmj.ihu.ac.ir/article_203599.html

Sedighpour, A., Zandieh, M., Alem Tabriz, A., & dori, b. (2019). Resilient Supply Chain Model in Iran Pharmaceutical Industries. *Industrial Management Studies, 16*(51), 55-106. (in persian) doi:10.22054/jims.2018.28335.1960

Sunhare, P., Chowdhary, R. R., & Chattopadhyay, M. K. (2022). Internet of things and data mining: An application oriented survey. *Journal of King Saud University –Computer and Information Sciences, 34*, 3569-3590. doi:10.1016/j.jksuci.2020.07.002

Tayyaran, S., Toloie-Eshlaghy, A., Radfar, R., & Purebrahimi, A. (2019). Agent-Based Model Developed to Assess Supply Chain Agility (Case Study: Institute of Higher Education, Science and Research Branch of Tehran). *Journal of System Management, 5*(1), 1-18. doi:20.1001.1.23222301.2019.5.1.1.2

Teymori, E. (2002). Introduction to Supply Chain Management. *Iranian Journal of Logistics & Supply Chain, 3*(10), 1-11. (in persian) Retrieved from https://scmj.ihu.ac.ir/article_203451.html

Tizro, A. (2014). Modeling Agility of Supply Chain. *Supply chain management, 15*(42), 4-17.(in persian) Retrieved from https://scmj.ihu.ac.ir/article_203517.html?lang=en

Toorajipour, R., Sohrabpour, V., Nazarpour, A., Oghazi, P., & Fischl, M. (2021). Artificial intelligence in supply chain management: A systematic literature review. *Journal of Business Research, 122*, 502-517. doi:10.1016/j.jbusres.2020.09.009

Tsiulin, S., Reinau, K. H., Hilmola, O. P., Goryaev, N., & Karma, A. (2020). Blockchain-based applications in shipping and port management: a literature review toward defining key conceptual frameworks. *Review of International Bussiness, 30*(2), 201-224. doi:10.1108/RIBS-04-2019-0051

Veysi, H. (2004). Supply chain modeling by simulation. *Iranian Journal of Logistics & Supply Chain, 6*(20), 1-5. (in persian) Retrieved from http://logiscm.ir/journal/archive/

Xie, P., Chen, Q., Qu, P., Fan, J., & Tang, Z. (2020). Research on financial platform of railway freight supply chain based on blockchain. *Smart and Resilient Transportation, 2*(2), 69-84. doi:10.1108/SRT-09-2020-0007

Yan, J., Xin, S., Liu, Q., Xu, W., Yang, L., Fan, L.,.. .. Wang, Q. (2014). Intelligent Supply Chain Integration and Management Based on Cloud of Things. *International Journal of Distributed Sensor Networks, 10*(3), 1-15. doi:10.1155/2014/624839

Zhong, R., Xu, X., & Wang, L. (2017). Food supply chain management: systems, implementations, and future research. *Industrial Management & Data Systems, 117*(9), 2085-2114. doi:10.1108/IMDS-09-2016-0391

Zhou, Y., & Xu, X. (2019). Intelligent Supply Chain Information System Based on Internet of Things Technology under Asymmetric Information. *symmetry, 11*(5), 1-17. doi:10.3390/sym11050656

Zubair khan, m., al-mushayt, o., alam, j., & ahmad, j. (2010). intelligent supply chain management. *Journal of Software Engineering and Applications, 3*(4), 404-408. doi:10.4236/jsea.2010.34045