Hunan Daxue Xuebao/Journal of Hunan University Natural Sciences
ISSN：1674-2974 | CN 43-1061 / N

DOI: 10.5281/zenodo.20121370
Vol: 63 | Issue: 05 | 2026

THE IMPACT OF INFORMATION TECHNOLOGIES AND LOGOISTICS AGILITY ON PRODUCTION COLLABORATION: MEDIATING ROLE OF KNOWLEDGE MANAGAMENT

NAWWAF HAMID SALMAN ALFAWAERH
Applied College, Imam Mohammad Ibn Saud Islamic University (IMSIU), KSA. Email: nhalfawreh@imamu.edu.sa

MAHMOUD ALLAHHAM
Faculty of Business, Amman Arab University, Amman, Jordan. Email: m.allahham@aau.edu.jo

MOHAMED BALLA MOHAMED ELFAKI
Applied College, Imam Mohammad Ibn Saud Islamic University (IMSIU), KSA.

Abstract

The present study investigated the relationship between information technologies, logistics agility and production collaboration with knowledge management as a mediator. A conceptual framework was developed to examine the direct links of information technologies with logistics agility, knowledge management and production collaboration, as well as the indirect links that run through knowledge management. The research method used in this study was quantitative research and the subjects were 542 managers of various industrial fields. Data analysis was done by using software of Structural Equation Modeling (SEM). The results showed that information technologies had a significant impact on improving communication efficiency, availability of information and coordination among the supply chain partners, thus positively affecting production collaboration. The findings also showed that logistics agility enhanced organizational responsiveness, operational flexibility and collaboration in decision making processes in dynamic market environments. In addition, a knowledge management acted as a significant mediator between the constructs of information technologies and logistics agility, as well as between logistics agility and production collaboration. This was reflected in the ability to share knowledge, learn from others, and integrate operational knowledge across supply chain networks. The study emphasized how transparent, trustful and strategically aligned production and logistics partners can be by using effective knowledge management practices, which promotes more efficient collaborative performance. The results pointed out that the prior investment of the information technology is necessary for the development of agile logistics capability and the establishment of a structured knowledge management system, in the interest of upgrading organization to sustainable production collaboration. The present study is a valuable contribution to the existing literature because of its empirical evidence on the interconnected role of technological capability, logistics agility and knowledge management in supporting production collaboration in current industrial contexts.

***Keywords**: Information Technologies, Logistics Agility, Collaboration, Resilience, Knowledge Managament.*

INTRODUCTION

Research in supply chain management (SCM) for many decades has revealed two streams of study: supply chain logistics agility and collaboration. The difference between collaboration and integration in the supply chain was initially mixed up, but researchers have now identified them. Companies are always looking for ways to partner with suitable partners to improve their supply chains' efficiency

DOI: 10.5281/zenodo.20121370
Vol: 63 | Issue: 05 | 2026

and adaptability to market changes in today's competitive business environment. In recent years, this complexity has led to vulnerabilities in supply chains due to hazards, instability and disruption (Munir, Jajja, Chatha & Farooq, 2020). Approximately 65% of businesses have at least one disruption annually, with 13% of those that had a disruption in 2019 suffering losses of more than €1 million. In spite of decades of research, integration and collaboration literature spans across certain sectors. When forming partnerships, the cooperative nature of multi-firm interaction is emphasised. Relationships and contracts are focused on; collaboration is desirable (Baryannis, Validi, Dani, & Antoniou, 2019). In the context of value co-creation, building relationships is emphasized (Ali, Abualrejal, Mohamed Udin, Shtawi, & Alqudah, 2022). Companies can enhance information capabilities using shared information to improve their analytical ability and maximize production collaboration (Wong et al, 2020).

Furthermore, organisations typically build business continuity plans and risk management strategies (Kwateng, Tetteh, Asare & Manu, 2022) to lessen the effects of disruptions. Implementing vendor-managed inventory contractual agreements (Baryannis et al., 2019) and structuring resilient supply chains to improve company performance in unpredictable times are common practical options (Abidi, de Leeuw, & Dullaert, 2020). Moreover, several studies have shown that the use of advanced Information Technologies is required for further business continuity, particularly when dealing with external disturbances (Jeble, Kumari, Venkatesh, & Singh, 2020). Over the last 20 years various companies have attempted to digitize operations. The concept of Industry 4.0 has gained popularity in the business world (Dolgui et al., 2019). Information Technologies enable the communication of the devices and systems and enhance the coordination of operations (Toorajipour, Sohrabpour, Nazarpour, Oghazi & Fischl, 2021a). Information Technologies can handle large volumes of operational data and can perform complex tasks quickly and accurately, and can also streamline the supply chain processes (Adem et al., 2018). The application of Information Technologies can enhance the decision making process in the supply chain by predicting and planning for future problems.

The supply chain could also extend beyond the exchange of information to sharing experiences, risks and rewards. To achieve success in changing markets, several manufacturers and service providers linked up with their primary suppliers to enhance supply and materials management and to incorporate them into their business plan. For spread of risks and returns evenly across participants in the supply chain management (SCM) (Kaming, Olomolaiye, Holt, & Harris, 1997), a long-term strategic plan is required. Partnership and collaboration among supply chain members are the main drivers of effective management (Briscoe & Dainty, 2005). Logistics agility can help in improving the efficiency, effectiveness and profitability of operations (Gligor & Holcomb, 2014). Collaboration is the subject of a significant amount of research and study in the academic fields of Sociology, Psychology, Marketing, Management and Supply Chain Management. This research investigated logistics agility as organizations cannot compete successfully on their own. But teamwork is still not well known. However, (Moeiny & Mokhlesi, 2011) proposed a paradigm that focused on the cooperation of the supply chains (SCC) to realize the employment of collaborative advantage and improvement of business performance. This approach fills the (Atkinson, 1999) gap in appropriately describing SCC since earlier definitions focused on and overlapped with supply chain integration. They missed numerous key characteristics in their investigation. Although well known, SCC's use in the manufacturing sector is still developing.

Three-way logistics agility along with strategic Information Technologies integration is a hugely important approach to enhancing production collaboration (Ali, Udin, & Abualrejal, 2023). Information Technologies are key players as they give real-time information using advanced analytics, thus enabling predicting disturbance ahead. Collaborative planning tools facilitate the sharing of information and help to increase the whole group's reaction to change (Atkinson, 1999). In an era of ever-changing business demands, knowledge management serves as the foundation for responsive,

DOI: 10.5281/zenodo.20121370
Vol: 63 | Issue: 05 | 2026

adaptive and agile organizations. Knowledge exchange and organizational learning can help firms enhance the performance of the supply chains in terms of coordination efficiency and collaborative production performance in supply chain networks. The following research questions were formulated from the gaps in the research listed above:

RQ1: Is there a relationship between logistics agility and Information Technologies on production collaboration?

RQ2: Does knowledge management affect the relationship between logistics agility and Information Technologies in production collaboration?

The current research takes an Organizational Information Processing Theory (OIPT) approach when answering the research questions and on the results. The study population for this study consists of the industrial sector in Jordan, as this sector is considered one of the important sectors in Jordan because of its importance in strengthening the Jordanian economy through tax revenues and providing job opportunities. This study aims at describing problems in the manufacturing industry and analysing the readiness of the organisations to embrace technological innovations and collaborative production systems. The research suggests cooperation mechanisms amongst the actors of the supply chain based on the use of Information Technologies solutions in the Jordanian companies. The mediating role of knowledge management will be discussed to get practical applications on how to enhance production collaboration. The study also focuses on skill development and training, regulatory issues, operational risk management, and sustainability. The present study has two objectives; the first is to make contribution to the development of this sector in Jordan and internationally, and the second is to gain a deeper understanding of the sector. Based on this, the importance of the study comes to the fore which deals with the impact of information technologies and logistics agility on production collaboration as a mediation role of knowledge management.

2. LITERATURE REVIEW

2.1 Logoistics agility

Experiments in the usefulness of cooperation in other areas have demonstrated several benefits to working cooperatively with others in the network. Working with suppliers can also help the business to reduce transaction costs, which can result in increased profits. (Alshawabkeh, Abu Rumman & Al-Abbadi, 2024). Research indicates that cooperatives have the potential of diversifying their resources in many ways. (Khaled, Yahiya, Ahmad, Allahham, & Al-, 2024) and have access to other resources. (Eid, 2024). This, therefore, will lead to higher profitability and performance through the development of long-term competitive advantage. To understand and model co-operation in the special hospital supply chain, however, it is important to have a clear understanding of the nature of co-operation and its various elements. The previous studies on collaboration mainly focused on the importance and impacts of collaboration in planning activities, defining a corporate environment that supports Knowledge Managament (Allahham et al., 2024), and establishing common goals (Guggisberg, 2022) as well as integration of cross-functional processes (Brandon-Jones, Squire, Autry, & Petersen, 2014). One group of researchers on the logoistics agility focused on lineage ratios, while the other carried out a side study (Nandi, Nandi, Moya, & Kaynak, 2020). Logoistics agility (SCC) has been perceived and defined in many manners by numerous scholars (Moshtari, 2012). The study has considered the impact of logoistics agility (SCC) for some companies, including on the saving of cost and reaction time for everyone. Some aspects of SCC have been identified including information exchange, compatibility, incentive compatibility, resource sharing, cooperation, and shared knowledge generation.

DOI: 10.5281/zenodo.20121370
Vol: 63 | Issue: 05 | 2026

Industrial AI solutions that are collaborative and integrated are critical for achieving a network supply chain. The flexible structure of Logoistics agility allows for the consideration of other collaboration management systems. When collaboration happens across the supply chain, it can be achieved to identify parts that can be adapted individually and which enhance the overall security of the supply chain (Stentoft & Rajkumar, 2018). Furthermore, the supply chain was recovering from unfinished events and operating on schedule when the cooperative partnerships experienced a fast, lagged adjustment that led to the co-ops' subscriptions Over the last decade, resilience has become a hot topic in the supply chain, as a result, we have seen a growing number of researchers investigating different mechanisms of resilience (Ivanov, Dolgui, & Sokolov, 2019). Meanwhile, predictive real-time attack analytics enhancements to Information Technologies have altered these Business Supply Chains. Information Technologies can foresee the future for companies which are diverse and think out of the box. This can help to prevent issues from developing by identifying and addressing them in advance (Choi, Wallace, & Wang, 2018). Rather than all running, captured and recorded in real time. We use the Information Technologies systems, because we helped to build them. This is nice and also can be referred to as Information Technologies-prescribed responses. Combining logoistics agility and creative Information Technologies abilities enables us to create supply chain that can withstand, adjust and recover from disruptions that happen.

2.2 Information Technologies

Many companies have adopted digitization in their organizations over the past 20 years. The term "Industry 4.0" just started to come into use in the corporate world recently (Alazab, 2024). Information Technologies (ITs) is one of the prominent technologies which enable machines to communicate with each other and with humans (Nandi et al., 2020). "AI brings clarity to the supply-chain picture by taking care of complex work faster and more accurately and by processing extremely large data volumes, too" (Olivier Garos, 2020). Despite being a relatively new concept, a number of applications of Information Technologies (AI) in supply-chain-management systems (SCM) are now becoming apparent, such as intelligent and adaptable decision making, and predicting and preempting issues in the supply chain (Toorajipour, Sohrabpour, Nazarpour, Oghazi, & Fischl, 2021b; Baryannis et al., 2019). "AI system in place, a network for value chains operates smoothly with expense decreases due to the automation of compliance processes" (Nayal et al., 2021). Through the use of AI, the ability to forecast demand for today's dynamic and rapidly changing business environment is greatly enhanced (Belhadi, Mani, Kamble, Khan, & Verma, 2021a). This will take customer engagement to new heights through highly customized interactions with AI-powered bots (Ali et al., 2023). These bots can track the delivery process, and the echo users can help with them, by helping them through a customer service team (Nayal et al., 2021). It is possible to use automation to streamline labor-intensive activities in warehouse work by using Information Technologies. Recently, Amazon and Alibaba have been integrating AI-powered robots to improve the productivity and efficiency of their supply chains (Fan, Zhang, Yahja, & Mostafavi, 2021). In the supply chain, every minute and every mile matters, and with the help of algorithms, Information Technologies (AI) can help to save time and money by optimizing routes and deliveries (Dubey et al., 2020). Information Technologies (AI) is the automation of intelligent behaviour. It is the ability of a system to correctly interpret the external data, learn from it, and use the learned data to achieve certain goals and tasks through flexible adaptation. An AI algorithm is an algorithm that simulates human cognition and information processing of a human or another living organism. They do this through the incorporation of mechanisms of learning, adaptation, reproduction and survival as observed in nature (Zapke, 2019). As per the research area carried out by (Guzman & Lewis, 2020) AI Techniques, they are formalism of data, methodology of AI, architectures, and AI algorithms that are clearly and explicitly defined. The techniques adopted in SCRes can be categorized into five areas: genetic algorithms, machine learning,

DOI: 10.5281/zenodo.20121370
Vol: 63 | Issue: 05 | 2026

fuzzy logic, rough set theory and multi-agent intelligent systems. The techniques are widely used in various field applications.

2.3 Knowledge Managament

The sharing of information (IS) would seem to be the vehicle in which critical strategic and tactical data becomes available to companies in the various stages of a supply chain. This data includes inventory levels, sales forecasts, sales two encouragement, etc. and many others, (Nayal et al., 2021). It is essential that visibility is available throughout the channel, otherwise information that can guide the fostering of logoistics agility would be considered indispensable (Nandi et al., 2020). As far as this strategic domain of supply chain management is concerned, Knowledge Managament is critical as it will affect a number of performance outcomes of interest - among which is production Collaboration. The purpose of this effort would then be to analyse how information sharing through logoistics agility and the integration of Information Technologies (AI) technology into the process leads to improved production Collaboration (Rahi & Abd Ghani, 2021). The ability of its supply chain is what resilience would be seen as expressed (Christopher & Peck, 2004) to anticipate the threats (Zhou & Benton, 2007) as they emerge, be responsive to the resulting disruptions and any surprises that flow from the aforementioned (Brusset & Teller, 2017), and to then recover from them. Regarding the real-time visibility on demand, the other aspects (transparency, etc.) would be provided by IS with respect to production Collaboration up. Many times entities could share their information related to the demand trends, inventory levels, capacity utilization, lead time for production and all the dynamics of the market (Anders & Biscop, 2019). This IS may provide tools that enable entities to anticipate risks, link their assets and operations to partners, and facilitate coordination of recovery vectors and contingency recoveries with their contingency vectors and recovery assets (Zhou & Benton, 2007). AI technology has benefited significantly as analytics capabilities have arisen in supply chain management from AI technology. It has the AI mentioned above that facilitates predictive modelling, prescriptive modelling, real-time decision-making and proceeding, as well as pattern identification and advanced analytics derived from the aforementioned, which is great for policing huge volumes of unstructured and structured data that has been created by ecosystems from various sources. Some of the data sources include radar monitoring, mobile phone contracts, legacy trade monitoring, and customer/client accounts (Allahham et al., 2024; Alrifai et al., 2023). Systems connected to the internet generate vast quantities of data, new information from shifts in demand patterns, latest information on seasonality and developments around products (Khaled et al., 2024). The use of AI algorithms for demand management, risk assessment, and inventory management can help companies provide more accurate and timely information, ultimately making them more resilient to supply chain disruptions due to the early identification and rapid response. (Jermsittiparsert & Pithuk, 2019). Coordination of the supply chain can help to facilitate resource, information and knowledge sharing between chain members and facilitate mutual trust and shared goals (Zhai & Shi, 2020). Collaborative programs like vendor-managed inventory, joint planning and collaborative forecasting allow for unconstrained Knowledge Managament across lines. By leveraging collaborative platforms and technologies, organizations can gain a more comprehensive understanding of their supply chain operations, enhance communication, and become more responsive to disruptions, leading to better production (Chen, 2020). The flow of relevant data and insights throughout the supply chain network is the core enabler of Knowledge Managament (Benzidia, Makaoui, & Bentahar, 2021) which frees the way for timely and actionable insights that are generated by AI technology, which improves the processing of data to a maximum level of efficiency and accuracy; Knowledge Managament is also characterized by high levels of trust and transparency, in order to facilitate collaboration among the members of the supply chain network. Doing this magnifies the benefits of these initiatives and helps organizations quickly adapt to changing market conditions and unforeseen events (Adem et al., 2018).

DOI: 10.5281/zenodo.20121370
Vol: 63 | Issue: 05 | 2026

The literature indicates that in the context of integrating AI technology and agility in logoistics, Knowledge Managament has emerged as a key element to improve production Collaboration. By using AI technology, Knowledge Managament facilitates organizations to make their supply chains more efficient, flexible and responsive (Fan et al., 2021). Future studies may include investigating how KM influences resilience and finding best practices for promoting effective KM in supply chains (Alshawabkeh et al., 2024).

2.4 Production Collaboration

The production Collaboration's resilience is "the capability to eradicate the undesirable effect of the unexpected and perturbing events and to possess the capability to return to its original or desirable pattern of operation or quickly take up a new position that is modified in such a way that is better suited to qualify the desired operational, financial, and market performance" (Abou Kamar, Albadry, Sheikhelsouk, Ali Al-Abyadh, & Alsetoohy, 2023). To build a resilient and robust supply chain, companies need to identify the many vulnerabilities of a supply chain, what would happen if such vulnerabilities occurred, how it can be detected, and how likely it is to happen (Liu, Shang, Lirn, Lai, & Lun, 2018). Businesses have various ways of making their supply networks resilient. Early in the COVID-19 outbreak, some supply chains began pondering that a "little more inventory and excess capacity buffers would have made it more resilient" and other began to take advantage of some manufacturing capacity not being used to manufacture drugs and other related products (Brandon-Jones et al., 2014). Multi-sourcing strategies were adopted by some supply chains to make their supply chain more resilient, instead of depending on one single source of supply (Liu et al., 2018). Near-shoring has gained more significance as a tool to decrease reliance on far-flung global networks that are geographically distant in the wake of the COVID-19 pandemic (Belhadi, Mani, et al., 2021a). As far as local supply chains are concerned, "not only do you have better control of your inventory, but you can respond to customers quicker, and if the local network becomes the new normal as they say, there's so much opportunity to standardize the technology platforms that are being used in each of the factories." (Al-Banna, Rana, Yaqot, & Menezes, 2023). The harmonization can help ensure the seamless movement of goods across the network (Alshawabkeh et al., 2024). The uniformity of the components of different products therefore simplifies the procurement process, and in the end, increases the level of resilience, as long as the product is not essential and is not directly noticeable by the consumer. Beyond the key components, the sustainability of the supply chain ecosystem also depends on agreements with its contract manufacturers and third party logistics suppliers.

3. HYPOTHESIS DEVELOPMENT

3.1 Logoistics agility and Production Collaboration

Logoistics agility is a collaborative and orchestrated work of many actors in the supply chain such as suppliers, manufacturers, distributors, and retailers. Such a partnership is not only crucial for reaching shared objectives, but it additionally has a significant impact on the entire strength of the supply chain system (Rha, 2020)."The aim of this research is to learn more about the impact of collaboration, both vertical and horizontal, on production Collaboration. Analysis of the two types of collaboration (vertical and horizontal) is done separately, and then the discovered topics are linked together to understand their relationship using a thematic map. The findings of the research show that collaboration between firms in the supply chain has a positive effect on improving the resilience of the firm (Alshawabkeh et al., 2024). Based on the little data that's available, a process of analysis and response is carried out. subsequently, as the situation was manipulated, S.C. The structure should be shaped according to the content and amount of data collected from the sites of interest. Based on this, the hypothesis is that collaborative actions between the parties involved in the supply chain have a positive impact on the resilience of the supply chain network, and that the agility of Logoistics plays

DOI: 10.5281/zenodo.20121370
Vol: 63 | Issue: 05 | 2026

a major role in the development and improvement of the system's adaptive capacity in the event of uncertainties and disruptions. Thus, the following hypotheses are proposed:

Hypothesis 1: Logoistics agility has a positive impact on production Collaboration.

3.2 Information Technologies and Production Collaboration

AI technology enhances production Collaboration by determining and optimizing the decision making processes. Technology provides data to be processed in real-time manufacturing, which improves responses and improves total flexibility. Data based on AI may help organizations discover dangers earlier, improve operations, and develop more robust and agile supply chains. Dynamic capabilities were selected as a suitable lens to study production Collaboration (Dubey et al., 2019), since AI has the potential to enhance the responsiveness and agility of the supply chain. Communication between machines and their components has always been regarded as an important field for the use of Information Technologies (Jeble et al., 2020). With intelligence, the supply chain manager can make smart and efficient decisions, proactively addressing challenges. The proactive AI system, therefore, helps to enhance the quality of the services provided and the satisfaction of consumers due to the timely delivery of undamaged products (Toorajipour et al., 2021a). In (Green, Whitten, & Inman, 2012), the authors conclude that Information Technologies are necessary in order to enhance production Collaboration. Facilitating better use of resources in the supply chains and strengthen their resilience. Despite the rise of the importance of AI in the supply chain domain and the expected benefits, we synthesize and consolidate this scattered knowledge through a systematic literature review of AI studies in production Collaboration and to enable the effective management of supply chain resources. Despite the rising visibility of AI in the supply chain realm and the opportunities it can bring, this fragmented knowledge is gathered and combined into a systematic literature review of AI research in production Collaboration. Therefore, the next hypothesis has been suggested by the previous studies is that:

Hypothesis 2: Information Technologies has a positive impact on production Collaboration.

3.3 Mediating Role of Knowledge Management

Knowledge Management collaboration and the integration of AI technology greatly support a positive-mediating effect between Production collaboration and Knowledge Management. The communication of information is seamless so that a supply chain can be adaptive and responsive (Yang, 2014). AI technology enables this symbiotic relationship to be further enhanced by real-time analysis of huge volumes of data, pattern recognition, and actionable recommendations. Implementing effective information sharing practices in the supply chain is crucial for developing dynamic capabilities that can enhance supply chain practices and performance. AI analytics can help identify disruptions and uncover group risks so that organizations can take action before they happen (Zhou & Benton, 2007). Agility is the combination of AI and Logoistics, which makes it a resilient ecosystem. In earlier research, Knowledge Management has been suggested to make supply chain stakeholders one powerful and self-analyzing organism that reacts to market changes, consumer needs and competition as one. The strategic role of Knowledge Managament in securing a competitive edge, in today's highly competitive markets is very important (Alrifai et al., 2023). This is because Knowledge Management enhances the intricacies of long-lasting collaboration and coordination that ultimately results in improved supply chain and firm performance (Allahham et al., 2024). Thus, when the visibility is enhanced through Knowledge Management in supply chains, better collaborations, agility, and performance (Al-Emran & Teo, 2020) will be achieved. Thus, we propose the following hypotheses, which state that;

DOI: 10.5281/zenodo.20121370
Vol: 63 | Issue: 05 | 2026

Hypothesis 3: a, b information-sharing has a positive mediating effect on the relationship between (a) SSC and Production Collaboration (b) Information Technologies and Production Collaboration (c) Knowledge Management and Production Collaboration.

4. CONCEPTUAL MODEL

Based on the organizational information processing theory (OIPT), the information sharing performance of a company depends on the ratio between the capacity of information sharing in a company and its information processing requirements (Belhadi, Mani, Kamble, Khan, & Verma, 2021b). However, when there are uncertainties in the supply chain, it may undermine the relationship between information sharing skills and the outputs it offers.

That is, supply chains must focus on proactively communicating with stakeholders, enabling their operations to be more visible and traceable. The literature shows a perspective of data analytics capability as an OIPT based information processing capability, aimed at studying its impact on production Collaboration (Belhadi, Kamble, Fosso Wamba, & Queiroz, 2021).

In principle, a business can reduce its reliance on data by improving its information-processing capacities, or by augmenting the more "mechanistic" resources that the business uses (Galbraith, 1974). They have a choice of the two options listed. Interdependent activities require a division of labour and centralisation of decisions in organisations that are more mechanistic (Adem et al., 2018). They are often able to manage issues and complexities, called "exception scenarios," using rules, hierarchy, objectives and goals.

The high number of exception situations causes the mechanistic model costs to be high and responsiveness to be low. According to (Qrunfleh & Tarafdar, 2014) the building of lateral and vertical information systems is an alternative method of enhancing an organization's information processing capabilities (Aranyossy, 2022).

They believe that if the capacity to share information equals the magnitude of the supply chain disruption, they can go so far as to argue that logoistics agility (SCC) can lead to production Collaboration. However, the inter-organizational information management capabilities of the supply chain network cannot be well depicted by this paradigm. Without them, capabilities such as logoistics agility and flexibility can't be developed (Qrunfleh & Tarafdar, 2014).

The unpredictable nature of the supply chain could change the relationship between the information-sharing capability and its consequences (Dubey et al., 2019). Thus, supply chain communication must be able to engage with stakeholders to enhance supply chain visibility and traceability.

One way to think about it, is to consider data analytics as an approach to analyse information by "OIPT" from the literature. Then you can check how it will impact production Collaboration (Chowdhury, Quaddus, & Agarwal, 2019). In principle, organizations can minimise their need for information or enhance their capacity to deal with information by adopting "mechanistic" organizational resources instead of information (Galbraith 1974).

In particular, OIPT's say that information organizations need to be able to deal with information that is increasingly uncertain. The ability to handle uncertain, volatile and changing information is a key capability for any business to possess (Dubey et al., 2019). Findings from this research indicate that AI should be developed from the ground up to remove functional problems and uncertainties; it is a tool to share information.

DOI: 10.5281/zenodo.20121370
Vol: 63 | Issue: 05 | 2026

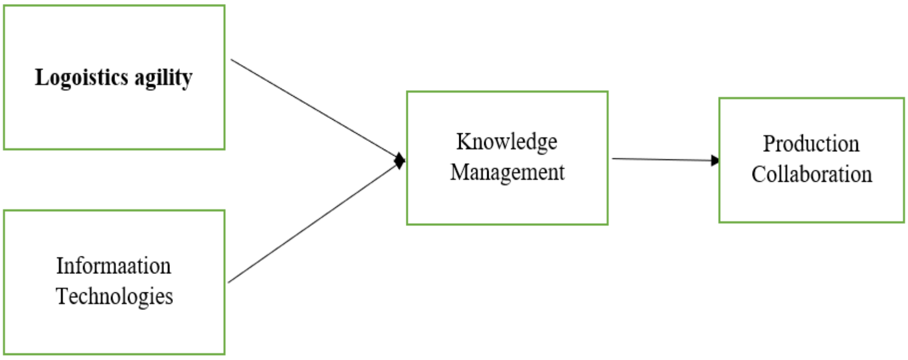

Figure 1: Framework of Study

5. METHODOLOGY

5.1 Population and Sampling

This research has used a quantitative approach to collect data using a well-structured questionnaire. The non-probability sample method was used, specifically a purposive sample, to select individuals for this current study. Specific criteria pertinent to the research objectives were defined to select participants who had knowledge relevant to AI technology, logoistics agility, and Knowledge Management within Jordanian industries. The aim was to understand the manufacturing sector in Jordan, which plays a significant role in the country's domestic gross product. To ensure comprehensive representation, the sample included 542 companies, including small, medium, and large enterprises from the managers of those companies. The data collection period lasted from June 2023 to January 2024. The companies were selected purposively based on their use of Information Technologies and their proactive management of supply chains. The study emphasized the importance of collaboration among supply chain stakeholders and the need for information-sharing practices to enhance resilience and fortify the ability to recover from disruptions within the supply chain. Table 1 provides an overview of the participating companies' demographic details, highlighting the sample's diversity.

Table 1: Respondents' Demography

Dimension		Frequency	Percentage
Gender	Male	325	60%
	female	217	40%
	Total	**542**	**100%**
Age	less than 27	54	10%
	27-less than 35	108	20%
	35-less than 45	217	40%
	45 and above	163	30%
	Total	*542*	*100%*
Years of experience	less than 10	152	28%
	10-less than 15	120	22%
	15-less than 20	124	23%
	20-less than 25	130	24%
	25 and above	16	3%
	Total	**542**	**100%**
Job title	Business Administration	293	54%
	Accounting	119	22%
	Social sciences	103	19%

DOI: 10.5281/zenodo.20121370
Vol: 63 | Issue: 05 | 2026

	Other	27	5%
	Total	**542**	**100%**
Education	Diploma	60	11%
	Undergraduate degree	325	60%
	Postgraduate degree (Master/PhD)	157	29%
	Total	**542**	**100%**

The results from the demographic table1 of respondents (sample size n=542) show a significant diversity in the sample composition making substantial insights into the demographic context for the participants. A strong gender diversity was maintained with; Males 60%, Females 40%, and Balanced gender representation around the world as expected. A varied distribution of age categories was also maintained with; 35 and less than 45 (40%). Suggesting a varied age distribution based on the nature of dating. The years of experience also varied from; P10 (28%) and >25 (3%). Based on the job titles Business Administration was the highest with; a BA of 54%. Again, this suggests varied job titles of professionals in dating. A varied educational background was also seen with an undergraduate degree of 60% and a Master/PhD of 29%. The educational diversity within the sample was evident.

6. DATA ANALYSIS

Data for this study was gathered using both online forms and physical questionnaires, employing a closed-ended questionnaire methodology derived from previous studies. The constructs under investigation included AI technology, logoistics agility, Knowledge Managament, and production Collaboration. To evaluate the impact of AI technology and logoistics agility on Knowledge Managament as a mediating element for production Collaboration, using PLS-SEM and PLS-MGA. Data was collected by a survey of 542 managers from manufacturing firms in Jordan to assess our hypothesized relationships. To assess the reliability of the data, we used Cronbach's alpha (CB), composite reliability (CR), and factor loadings. Table 2 shows that the reliability of all measurement models is established since CB alpha is above the recommended threshold of 0.70, CR is above 0.60, and factor loading is above 0.50 (J F Hair, Hult, Ringle, & Sarstedt, 2014). Then to ensure overall validity, we evaluated convergent and discriminate validities. The convergent validity is confirmed as each measurement model has its AVE value outperformed the threshold of 0.50, as shown in Table 2. To test the discriminate validity, we used the Fornell-Larcker criteria. As shown in Table 3, the diagonal value of square-rooted AVEs is greater than their corresponding row and column construct values, indicating good discriminate validity for all measurement models.

For the AI technology construct, consisting of seven items, such as Technology Adoption Commitment, Trust in Technology, Adaptability and Collaboration, Secure Implementation, Capability and Skill Development, Digital Experience, and Infrastructure Readiness, items were adopted from (Olan, Liu, Suklan, Jayawickrama, & Arakpogun, 2021). The logoistics agility construct, encompassing items like continuous technical improvement, information technology adoption commitment, collaborative new product development, reduced product development cycles, and optimized supply chain deliveries, was drawn from (Alshawabkeh et al., 2024; Uvet, Celik, Cevikparmak, & Adana, 2021). The information-sharing construct comprised six items, including Transparent Criticism Handling, Encouraging Partner Feedback, Employee Feedback from Suppliers, Open Knowledge Managament , Technology-Driven Knowledge Managament , and Guidelines for Effective Knowledge Managament , adapted from (Uvet et al., 2021). Lastly, production Collaboration, Formalized Risk and Revenue Sharing Document, Sharing Information for Business Purposes, Collaboration for Risk Reduction, Assessment of Information Security Risks, Visibility Across the Supply Chain, Adaptive Capability for Resilience, Trust Requirements for Information Access, Incident Reporting Mechanism, Focus on Supply Chain Structure for Risk Reduction, and Sustainability for Resilience, was adopted from (Ali et

DOI: 10.5281/zenodo.20121370
Vol: 63 | Issue: 05 | 2026

al., 2023). Following data collection through both online and physical means, the study utilized Partial Least Square-Structural Equation Modeling (PLS-SEM) to assess the impact of AI technology and logoistics agility on production Collaboration and examine the mediation effect of Knowledge Managament. Additionally, the study explored the moderation effect of the control variable. PLS-SEM, chosen for its robust modeling approach, ensured fitness through a threefold strategy, encompassing the evaluation of reliability, validity (convergent and discriminant), and model fitness. Furthermore, the hypothesized relationships were tested. PLS-Multi Group Analysis (MGA).

Table 2: Cross Loading Analysis

Constructs	Items	Factor loadings	Cronbach's Alpha	CR	(AVE)
Logoistics agility	SCC-1	0.744	0.819	0.839	0.645
	SCC-2	0.787			
	SCC-3	0.827			
	SSC-4	0.851			
Knowledge Managament	INFO-1	0.841	0.868	0.879	0.604
	INFO -2	0.822			
	INFO -3	0.833			
	INFO -4	0.751			
	INFO -5	0.730			
	INFO -6	0.672			
Information Technologies	A1-1	0.833	0.860	0.866	0.641
	AI-2	0.827			
	AI-3	0.795			
	AI-4	0.767			
	AI-5	0.779			
Production Collaboration	SCR-1	0.654	0.904	0.196	0.566
	SCR-2	0.680			
	SCR-3	0.700			
	SCR-4	0.746			
	SCR-5	0.718			
	SCR-6	0.842			
	SCR-7	0.806			
	SCR-8	0.786			
	SCR-9	0.815			

7. STRUCTURAL MODEL

Following the establishment of trust in the accuracy of the measurement system, the structural design is analyzed. In order to analyze structural models, it is necessary to evaluate the degree to which the theory or ideas are supported by the data, and as a result, it is necessary to determine whether or not the hypothesis is supported by the data.

Table 3: Discriminant Validity (Fornell-Larcker's test)

	Information Technologies	Knowledge Managament	Production Collaboration	Logoistics agility
Information Technologies	**0.801**			
Knowledge Managament	0.943	**0.777**		
Production Collaboration	0.947	0.943	**0.752**	
Logoistics agility	0.508	0.511	0.455	**0.743**

The result of the Fornell–Larcker test which examines the discriminant validity in CFA or SEM is provided in the table. In this table, all of the values specified are either off-diagonal correlation

DOI: 10.5281/zenodo.20121370
Vol: 63 | Issue: 05 | 2026

coefficients between constructs or the square root of the Average Variance Extracted (AVE) for a construct is located on the diagonal. If the square roots of AVEs are larger than the correlations that each construct has with the remainder, then the criterion for discriminant validity is met. For example, in order to meet the discriminant validity criterion, construct "Information Technologies" which has an αAVE(s) = 0.801 should be greater than its other construct correlations with "Logoistics agility", "Knowledge Managament" and "Production Collaboration". The same principle is also true for all the other constructs of the model. In short, this table allows us to check the independence and distinctiveness of each individual construct, and hence the reliability and validity of the measurement model in CFA or SEM analyses.

Table 4: Discriminant Validity HTMT

	Information Technologies	Knowledge Managament	Production Collaboration	Logoistics agility
Information Technologies				
Knowledge Managament	0.621			
Production Collaboration	0.674	0.732		
Logoistics agility	0.628	0.594	0.530	

The Heterotrait-Monotrait (HTMT) ratio test results are presented in the Table. All constructs in the model present discriminant validity as their ratios are below the well-accepted threshold. For instance, "Knowledge Managament " and "Logoistics agility", and "Information intelligence" HTMT ratios are 0.621 and 0.530, respectively. Likewise, "Knowledge Managament " and "Production Collaboration", and "Knowledge Managament " HTMT ratios are 0.732 and 0.674, respectively. All above-mentioned values imply that correlations within constructs are considerably higher than with the other constructs, and thus provide further evidence of the robustness of the analytical model and support the good discriminant validity hypothesis.

8. HYPOTHESES TESTING

The path coefficient of the structural model was investigated using PLS. It is possible to compare the path coefficient of SmartPLS 3.0 to the beta weight of the regression. It is possible that these estimated route coefficients might range anywhere from -1 to 1, with -1 indicating that there is no link and 1 indicating that there is a substantial positive or negative association. The information on the significance level, T-value, P-value, path coefficient, and standard error is shown in Table 5.

Table 5: Structural model estimates (Path coefficients)

Hypo	Relationships	Std. Beta	Std. Error	T-Value	P-Values	Decision
H1	Information Technologies -> Production Collaboration	0.195	0.042	4.514	0.000	Supported
H2	Logoistics agility -> Production Collaboration	0.411	0.051	7.808	0.000	Supported
H3	Knowledge Managament -> Production Collaboration	0.221	0.052	4.465	0.000	Supported
H4	Logoistics agility -> Knowledge Managament -> Production Collaboration	0.236	0.044	5.353	0.000	Supported
H5	Logoistics agility -> Knowledge Managament -> Production Collaboration	0.245	0.051	7.461	0.000	Supported

Path coefficients in the structural model with their sizes and pervasive connections between different variables are illustrated in Table 5. To examine specific relationships within the model, each hypothesis (H1 to H5) is designed to be tested. The results of the test reveal the presence of distinct relationships in all directions: the strength of IV Information Technologies in driving production

DOI: 10.5281/zenodo.20121370
Vol: 63 | Issue: 05 | 2026

Collaboration (t=4.514, p < 0.001), there is a high correlation. Furthermore, for "Production Collaboration" and "Logoistics agility," there is a strong relationship (0.411 path coefficient; t-value = 7.808, p-value < 0.001). Finally, "Knowledge Managament " and "Production Collaboration" are significantly linked with a coefficient value of 0.221 (t-value = 4.465, p-value < 0.001). On "Production Collaboration," both hypotheses H4 and H5 highlight the combined role of of "Logoistics agility" and "Knowledge Managament," with path coefficients of 0.236 and 0.245 (t-values > 5.353, p-values < 0.001). This finding tells us how important Information Technologies is in production Collaboration, as well as how beneficial their contributions can be.

Table 6: R^2 and R^2 Adjusted

Variable	R^2	R^2 Adjusted
Production Collaboration	0.880	0.885

Table 6 contains the findings of R2 to assess the accuracy of the forecasts. The Production Collaboration R2 score is 0.880. These findings demonstrate that explanatory factors account for more than 12 percent of variations.

9. DISCUSSION

The aim of this study is to determine the role of Knowledge Managament as a mediator between the impact of AI technology and logoistics agility on production Collaboration within the context of Jordanian industries, and to give some practical implications to enhance the local business environment. Through a thorough review of the current practices, the present study aims to help achieve a comprehensive understanding of the level of AI adoption and the logoistics agility in Jordan. This awareness will prove invaluable when it comes to recognizing unique challenges in the industries and understanding how ready they are for what is a seismic shift with the integration of AI. This study aims to offer preliminary ideas for designing AI solutions specifically for the context of Jordanian business firms, and to set some initial frameworks to facilitate the effective collaboration among stakeholders in the supply chain to realize the above mentioned (Ali et al., 2023). Furthermore, this study will investigate the mediating role of Knowledge Managament which will hopefully result in practical strategies for making focused, collaborative approaches work. Therefore, the skill development and training required will be foundational to this study, however, a benefit of this study would be that it also takes into consideration issues relating to regulation, risk management and long-term sustainability in the Jordanian context. It is hoped that such a move, and making the execution of this project more of an active participation of industry, government and academia, will help academic research and implementation close the gap even closer, for the good of Jordanian industries and their competitiveness and resilience in the increasingly complex and demanding global environment (S. A. Khan, Al Shamsi & Haider, 2024).

The results of our research are consistent with the literature of AI Technology, logoistics agility, Knowledge Managament and production Collaboration. The significance of the relationship in the total sample and large subgroup suggests that the use of AI technology has a more salient effect on Knowledge Managament in larger organizations (Zhong, Jia, Chen, Hong, & Yu, 2023). Moreover, the uniformity in the results obtained from all the sample groups shows the important role played by Knowledge Managament in the improvement of production Collaboration, as stated in the literature (Abuzzahda, 2019), that the information flow plays a significant role in improving the management of supply chains. Moreover, the great relation found in all the samples groups confirms the above positive effect of collaboration on Knowledge Managament. This result shows that collaboration and teamwork inside the supply chain can contribute to better Knowledge Managament (Kim & Shin, 2019), but it doesn't end there. Indeed, this is also a reflection of the increase in collaboration among

DOI: 10.5281/zenodo.20121370
Vol: 63 | Issue: 05 | 2026

manufacturing companies with the best of the best in the supply chain, and the resulting benefits of Knowledge Managament flow. However, the significance of the experiences in the various sample groups indicate that there is an indirect effect of AI Technology, Knowledge Managament and Production Collaboration, such that larger organizations may be more likely to benefit from the joint impact of the three. As a result of this, it has been emphasized that the implicated association being detected between Logoistics agility, Knowledge Managament and production Collaboration withstands the collaborative interplay across the different size of Manufacturing organizations (Dubey et al., 2019). To grasp the link between the influence of AI technology and logoistics agility on the process of production Collaboration, it is essential to drill down into all these factors. One needs to grasp the combination of AI technology and the co-working model of the supply chain in order to enhance its resilience. Furthermore, the importance of Knowledge Managament as the mediating variable between these factors and the way in which these factors influence is also explained. The mixture of case studies and best practices will not only give examples of successful implementations but also give recognition to the different problems and important factors to be taken with an open mind. As well, the identification of possible areas for research offers chances to further explore questions of production Collaboration development. This paper may provide practical and pragmatic guidance to those attempting to be resilient in the midst of the complex challenges that today's supply chains face in delivering all of these desires in a concrete scientific way. Based on these arguments, the system dynamics approach as well as the case research should be applied to assess the effectiveness of supply chain responses.

Acknowledgment

This work was supported and funded by the Deanship of Scientific Research at Imam Mohammad ibn Saud Islamic University (IMSIU) (grant number IMSIU-DDRSP2604).

References

1) Abidi, H., de Leeuw, S., & Dullaert, W. (2020). Performance management practices in humanitarian organisations. *Journal of Humanitarian Logistics and Supply Chain Management*, *10*(2), 125–168. https://doi.org/10.1108/JHLSCM-05-2019-0036

2) Abou Kamar, M., Albadry, O. M., Sheikhelsouk, S., Ali Al-Abyadh, M. H., & Alsetoohy, O. (2023). Dynamic Capabilities Influence on the Operational Performance of Hotel Food Supply Chains: A Mediation-Moderation Model. *Sustainability (Switzerland)*, *15*(18). https://doi.org/10.3390/su151813562

3) Adem, S. Al, Childerhouse, P., Egbelakin, T., Wang, B., Teerlink, M., Tabassum, R., … Verma, S. (2018). Big data analytics and Information Technologies pathway to operational performance under the role of of entrepreneurial orientation and environmental dynamism: A study of manufacturing organisations. *Industrial Marketing Management*, *226*(0123456789), 3–5. https://doi.org/10.1016/j.ijpe.2019.107599

4) Al-Banna, A., Rana, Z. A., Yaqot, M., & Menezes, B. (2023). Interconnectedness between Production Collaboration, Industry 4.0, and Investment. *Logistics*, *7*(3). https://doi.org/10.3390/logistics7030050

5) Al-Emran, M., & Teo, T. (2020). Do knowledge acquisition and knowledge sharing really affect e-learning adoption? An empirical study. *Education and Information Technologies*, *25*(3), 1983–1998.

6) Alazab, M. (2024). *Industry 4 . 0 Innovation : A Systematic Literature Review on the Role of Blockchain Technology in Creating Smart and Sustainable Manufacturing Facilities*.

7) Ali, A. A. A., Abualrejal, H. M. E., Mohamed Udin, Z. B., Shtawi, H. O., & Alqudah, A. Z. (2022). *The Role of Supply Chain Integration on Project Management Success in Jordanian Engineering Companies BT - Proceedings of International Conference on Emerging Technologies and Intelligent Systems* (M. Al-Emran, M. A. Al-Sharafi, M. N. Al-Kabi, & K. Shaalan, eds.). Cham: Springer International Publishing.

DOI: 10.5281/zenodo.20121370
Vol: 63 | Issue: 05 | 2026

8) Ali, A. A. A., Udin, Z. B. M., & Abualrejal, H. M. E. (2023). The Impact of Information Technologies and Production Collaboration on the Companies Supply Chains Performance: The Moderating Role of Supply Chain Dynamism. *Lecture Notes in Networks and Systems*, *550 LNNS*(2023), 17–28. https://doi.org/10.1007/978-3-031-16865-9_2

9) Allahham, M., Sharabati, A. A. A., Al-Sager, M., Sabra, S., Awartani, L., & Khraim, A. S. L. (2024). Supply chain risks in the age of big data and Information Technologies: The role of risk alert tools and managerial apprehensions. *Uncertain Supply Chain Management*, *12*(1), 399–406. https://doi.org/10.5267/j.uscm.2023.9.012

10) Alrifai, K., Obaid, T., Ali, A. A. A., Abulehia, A. F. S., Abualrejal, H. M. E., & Nassoura, M. B. A. R. (2023). *The Role of Information Technologies in Project Performance in Construction Companies in Palestine BT - International Conference on Information Systems and Intelligent Applications* (M. Al-Emran, M. A. Al-Sharafi, & K. Shaalan, eds.). Cham: Springer International Publishing.

11) Alshawabkeh, R. O., Abu Rumman, A. R., & Al-Abbadi, L. H. (2024). The nexus between digital collaboration, analytics capability, and production Collaboration of the food processing industry in Jordan. *Cogent Business and Management*, *11*(1). https://doi.org/10.1080/23311975.2023.2296608

12) Aranyossy, M. (2022). Technology Adoption in the Digital Entertainment Industry during the COVID-19 Pandemic: An Extended UTAUT2 Model for Online Theater Streaming. *Informatics*, *9*(3). https://doi.org/10.3390/informatics9030071

13) Atkinson, R. (1999). Project management: cost, time, and quality, two best guesses and a phenomenon, its time to accept other success criteria. *International Journal of Project Management*, *17*(6), 337–342.

14) Baryannis, G., Validi, S., Dani, S., & Antoniou, G. (2019). Supply chain risk management and Information Technologies: state of the art and future research directions. *International Journal of Production Research*, *57*(7), 2179–2202. https://doi.org/10.1080/00207543.2018.1530476

15) Belhadi, A., Kamble, S., Fosso Wamba, S., & Queiroz, M. M. (2021). Building supply-chain resilience: an Information Technologies-based technique and decision-making framework. *International Journal of Production Research*, *0*(0), 1–21. https://doi.org/10.1080/00207543.2021.1950935

16) Belhadi, A., Mani, V., Kamble, S. S., Khan, S. A. R., & Verma, S. (2021a). Information Technologies-driven innovation for enhancing production Collaboration and performance under the effect of supply chain dynamism: an empirical investigation. *Annals of Operations Research*, 1–26.

17) Belhadi, A., Mani, V., Kamble, S. S., Khan, S. A. R., & Verma, S. (2021b). Information Technologies-driven innovation for enhancing production Collaboration and performance under the effect of supply chain dynamism: an empirical investigation. *Annals of Operations Research*, (0123456789). https://doi.org/10.1007/s10479-021-03956-x

18) Brandon-Jones, E., Squire, B., Autry, C. W., & Petersen, K. J. (2014). A Contingent Resource-Based Perspective of Production Collaboration and Robustness. *Journal of Supply Chain Management*, *50*(3), 55–73. https://doi.org/10.1111/jscm.12050

19) Briscoe, G., & Dainty, A. (2005). Construction supply chain integration: An elusive goal? *Supply Chain Management*, *10*(4), 319–326. https://doi.org/10.1108/13598540510612794

20) Chen, Y. (2020). An investigation of the influencing factors of Chinese WeChat users' environmental information-sharing behavior based on an integrated model of UGT, NAM, and TPB. *Sustainability*, *12*(7), 2710.

21) Choi, T., Wallace, S. W., & Wang, Y. (2018). Big data analytics in operations management. *Production and Operations Management*, *27*(10), 1868–1883.

22) Chowdhury, M. M. H., Quaddus, M., & Agarwal, R. (2019). Production Collaboration for performance: role of relational practices and network complexities. *Supply Chain Management: An International Journal*.

DOI: 10.5281/zenodo.20121370
Vol: 63 | Issue: 05 | 2026

23) Dolgui, A., Ivanov, D., Sethi, S. P., & Sokolov, B. (2019). Scheduling in production, supply chain, and Industry 4.0 systems by optimal control: fundamentals, state-of-the-art, and applications. *International Journal of Production Research*, *57*(2), 411–432.

24) Dubey, R., Gunasekaran, A., Childe, S. J., Bryde, D. J., Giannakis, M., Foropon, C., … Hazen, B. T. (2020). Big data analytics and Information Technologies pathway to operational performance under the role of of entrepreneurial orientation and environmental dynamism: A study of manufacturing organisations. *International Journal of Production Economics*, *226*, 107599. https://doi.org/10.1016/j.ijpe.2019.107599

25) Dubey, R., Gunasekaran, A., Childe, S. J., Roubaud, D., Fosso Wamba, S., Giannakis, M., & Foropon, C. (2019). Big data analytics and organizational culture as complements to swift trust and collaborative performance in the humanitarian supply chain. *International Journal of Production Economics*, *210*(September 2018), 120–136. https://doi.org/10.1016/j.ijpe.2019.01.023

26) Eid, B. (2024). *Uncertain Supply Chain Management The mediating role of supply chain digitization in the relationship between supply chain agility and operational performance*. *12*, 669–684. https://doi.org/10.5267/j.uscm.2024.1.017

27) Fan, C., Zhang, C., Yahja, A., & Mostafavi, A. (2021). Disaster City Digital Twin: A vision for integrating artificial and human intelligence for disaster management. *International Journal of Information Management*, *56*(March), 102049. https://doi.org/10.1016/j.ijinfomgt.2019.102049

28) Galbraith, J. R. (1974). Organization design: An information processing view. *Interfaces*, *4*(3), 28–36.

29) Gligor, D. M., & Holcomb, M. (2014). The road to supply chain agility: An RBV perspective on the role of logistics capabilities. *International Journal of Logistics Management*, *25*(1), 160–179. https://doi.org/10.1108/IJLM-07-2012-0062

30) Green, K. W., Whitten, D., & Inman, R. A. (2012). Aligning marketing strategies throughout the supply chain to enhance performance. *Industrial Marketing Management*, *41*(6), 1008–1018. https://doi.org/10.1016/j.indmarman.2012.02.003

31) Guggisberg, S. (2022). Transparency in the activities of the Food and Agriculture Organization for sustainable fisheries. *Marine Policy*, *136*(February), 104498. https://doi.org/10.1016/j.marpol.2021.104498

32) Gupta, R., Rathore, B., & Biswas, B. (2022). Impact of COVID-19 on supply chains: lessons learned and future research directions. *International Journal of Quality and Reliability Management*, *39*(10), 2400–2423. https://doi.org/10.1108/IJQRM-06-2021-0161

33) Guzman, A. L., & Lewis, S. C. (2020). Information Technologies and communication: A Human–Machine Communication research agenda. *New Media & Society*, *22*(1), 70–86.

34) Hair, J F, Hult, G. T. M., Ringle, C. M., & Sarstedt, M. (2014). A Primer on Partial Least Squares Structural Equation Modeling (PLS-SEM). Sage Publications. *European Journal of Tourism Research*, *6*(2), 211–213.

35) Hair, Joseph F, Hult, G. T. M., Ringle, C. M., Sarstedt, M., & Thiele, K. O. (2017). Mirror, mirror on the wall: a comparative evaluation of composite-based structural equation modeling methods. *Journal of the Academy of Marketing Science*, *45*(5), 616–632.

36) Henseler, J., Ringle, C. M., & Sarstedt, M. (2015). A new criterion for assessing discriminant validity in variance-based structural equation modeling. *Journal of the Academy of Marketing Science*, *43*(1), 115–135.

37) Ivanov, D., Dolgui, A., & Sokolov, B. (2019). The impact of digital technology and Industry 4.0 on the ripple effect and supply chain risk analytics. *International Journal of Production Research*, *57*(3), 829–846.

38) Jeble, S., Kumari, S., Venkatesh, V. G., & Singh, M. (2020). Influence of big data and predictive analytics and social capital on performance of humanitarian supply chain: Developing framework and future research directions. *Benchmarking*, *27*(2), 606–633. https://doi.org/10.1108/BIJ-03-2019-0102

DOI: 10.5281/zenodo.20121370
Vol: 63 | Issue: 05 | 2026

39) Jermsittiparsert, K., & Pithuk, L. (2019). Exploring the link between adaptability, information technology, agility, mutual trust, and flexibility of a humanitarian supply chain. *International Journal of Innovation, Creativity and Change*, *5*(2), 432–447.

40) Kabra, G., Ramesh, A., Brun, A., Karaosman, H., Barresi, T., Clark, J. A., … LOON, L. K. (2019). Agility and resilience as antecedents of supply chain performance under moderating role of of organizational culture within the humanitarian setting: a dynamic capability view. *Production Planning and Control*, *7*(2), 1158–1174. https://doi.org/10.1080/09537287.2018.1542174

41) Kaming, P. F., Olomolaiye, P. O., Holt, G. D., & Harris, F. C. (1997). Factors influencing construction time and cost overruns on high-rise projects in Indonesia. *Construction Management & Economics*, *15*(1), 83–94.

42) Kavota, J. K., Kamdjoug, J. R. K., & Wamba, S. F. (2020). Social media and disaster management: Case of the north and south Kivu regions in the Democratic Republic of the Congo. *International Journal of Information Management*, *52*(January), 102068. https://doi.org/10.1016/j.ijinfomgt.2020.102068

43) Khaled, H., Yahiya, A., Ahmad, B., Allahham, M., & Al-, M. (2024). *Uncertain Supply Chain Management The mediating role of ICT on the impact of supply chain management (SCM) on organizational performance (OP): A field study in Pharmaceutical Companies in Jordan*. *12*, 1251–1266. https://doi.org/10.5267/j.uscm.2023.11.011

44) Khan, A., Bakkappa, B., Metri, B. A., & Sahay, B. S. (2009). Impact of agile supply chains' delivery practices on firms' performance: cluster analysis and validation. *Supply Chain Management: An International Journal*.

45) Khan, S. A., Al Shamsi, I. R., & Haider, S. Z. (2024). The Potential Impact of Blockchain Technology on Integration, Agility, and Collaboration in Supply Chain Performance is the Focus of an Empirical Study Conducted Within the Industries of Oman and Pakistan. *Kurdish Studies*, *12*(1), 748–763. https://doi.org/10.58262/ks.v12i1.047

46) Kim, J. S., & Shin, N. (2019). The impact of blockchain technology application on supply chain partnership and performance. *Sustainability (Switzerland)*, *11*(21). https://doi.org/10.3390/su11216181

47) Kwateng, K. O., Tetteh, F. K., Asare, N., & Manu, D. (2022). Can intercluster coordination mediate the relationship between supply chain flexibility and humanitarian supply chain performance? *Journal of Humanitarian Logistics and Supply Chain Management*, *12*(3), 449–470. https://doi.org/10.1108/JHLSCM-09-2021-0086

48) Liu, C. L., Shang, K. C., Lirn, T. C., Lai, K. H., & Lun, Y. H. V. (2018). Production Collaboration, firm performance, and management policies in the liner shipping industry. *Transportation Research Part A: Policy and Practice*, *110*, 202–219. https://doi.org/10.1016/j.tra.2017.02.004

49) Moeiny, E., & Mokhlesi, J. (2011). Management of Relief Supply Chain and Humanitarian Aids through Production Collaboration. *Master Research Project*, (18).

50) Moshtari, M. (2012). *Understanding the Drivers and Barriers of Collaboration among Humanitarian Understanding the Drivers and Barriers of Coordination Among Humanitarian Organizations The revised version of this conference paper has been published in Organizations w ith the f*. (May).

51) Munir, M., Jajja, M. S. S., Chatha, K. A., & Farooq, S. (2020). Supply chain risk management and operational performance: The enabling role of supply chain integration. *International Journal of Production Economics*, *227*(May). https://doi.org/10.1016/j.ijpe.2020.107667

52) Nandi, M. L., Nandi, S., Moya, H., & Kaynak, H. (2020). Blockchain technology-enabled supply chain systems and supply chain performance: a resource-based view. *Supply Chain Management*, *25*(6), 841–862. https://doi.org/10.1108/SCM-12-2019-0444

53) Nayal, K., Raut, R., Priyadarshinee, P., Narkhede, B. E., Kazancoglu, Y., & Narwane, V. (2021). Exploring the role of Information Technologies in managing agricultural supply chain risk to counter the impacts of the COVID-19 pandemic. *International Journal of Logistics Management*. https://doi.org/10.1108/IJLM-12-2020-0493

DOI: 10.5281/zenodo.20121370
Vol: 63 | Issue: 05 | 2026

54) Olan, F., Liu, S., Suklan, J., Jayawickrama, U., & Arakpogun, E. (2021). The role of Information Technologies networks in sustainable supply chain finance for food and drink industry. *International Journal of Production Research*, *0*(0), 1–16. https://doi.org/10.1080/00207543.2021.1915510

55) Olivier Garos. (2020). Technology Acceptance Model: Which factors drive the acceptance of AI among employees? *Master Thesis*.

56) Qrunfleh, S., & Tarafdar, M. (2014). Supply chain information systems strategy: Impacts on supply chain performance and firm performance. *International Journal of Production Economics*, *147*(PART B), 340–350. https://doi.org/10.1016/j.ijpe.2012.09.018

57) Rahi, S., & Abd Ghani, M. (2021). Examining Internet banking user's continuance intention through the lens of technology continuance theory and task technology fit model. *Digital Policy, Regulation and Governance*, *23*(5), 456–474. https://doi.org/10.1108/DPRG-11-2020-0168

58) Rahi, S., Khan, M. M., & Alghizzawi, M. (2021). Extension of technology continuance theory (TCT) with task technology fit (TTF) in the context of Internet banking user continuance intention. *International Journal of Quality and Reliability Management*, *38*(4), 986–1004. https://doi.org/10.1108/IJQRM-03-2020-0074

59) Rha, J. S. (2020). Trends of research on production Collaboration: A systematic review using network analysis. *Sustainability (Switzerland)*, *12*(11). https://doi.org/10.3390/su12114343

60) Stentoft, J., & Rajkumar, C. (2018). Does supply chain innovation pay off? *Contributions to Management Science*, 237–256. https://doi.org/10.1007/978-3-319-74304-2_11

61) Tarafdar, M., & Qrunfleh, S. (2017). Agile supply chain strategy and supply chain performance: complementary roles of supply chain practices and information systems capability for agility. *International Journal of Production Research*, *55*(4), 925–938.

62) Toorajipour, R., Sohrabpour, V., Nazarpour, A., Oghazi, P., & Fischl, M. (2021a). Information Technologies in supply chain management: A systematic literature review. *Journal of Business Research*, *122*, 502–517. https://doi.org/10.1016/j.jbusres.2020.09.009

63) Toorajipour, R., Sohrabpour, V., Nazarpour, A., Oghazi, P., & Fischl, M. (2021b). Information Technologies in supply chain management: A systematic literature review. *Journal of Business Research*, *122*(May 2020), 502–517. https://doi.org/10.1016/j.jbusres.2020.09.009

64) Uvet, H., Celik, H., Cevikparmak, S., & Adana, S. (2021). Logoistics agility in performance-based contracting: an empirical study. *International Journal of Productivity and Performance Management*, *70*(4), 769–788. https://doi.org/10.1108/IJPPM-01-2019-0008

65) Wong, C. W. Y., Lirn, T.-C., Yang, C.-C., & Shang, K.-C. (2020). Supply chain and external conditions under which production Collaboration pays: An organizational information processing theorization. *International Journal of Production Economics*, *226*, 107610. https://doi.org/https://doi.org/10.1016/j.ijpe.2019.107610

66) Yang, J. (2014). Supply chain agility: Securing performance for Chinese manufacturers. *International Journal of Production Economics*, *150*, 104–113. https://doi.org/10.1016/j.ijpe.2013.12.018

67) Zapke, M. (2019). *Information Technologies in Supply Chains*. (January).

68) Zhai, X., & Shi, L. (2020). Understanding How the Perceived Usefulness of Mobile Technology Impacts Physics Learning Achievement: a Pedagogical Perspective. *Journal of Science Education and Technology*, *29*(6), 743–757. https://doi.org/10.1007/s10956-020-09852-6

69) Zhong, J., Jia, F., Chen, X., Hong, Y., & Yu, Y. (2023). Internal and external collaboration and supply chain performance: a fit approach. *International Journal of Logistics Research and Applications*, *26*(10), 1267–1284. https://doi.org/10.1080/13675567.2022.2042226

70) Zhou, H., & Benton, W. C. (2007). Supply chain practice and Knowledge Managament . *Journal of Operations Management*, *25*(6), 1348–1365. https://doi.org/https://doi.org/10.1016/j.jom.2007.01.009