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The Role of Artificial Intelligence in Enhancing Supply Chain

Development in Palestine

Abstract

The primary objective of this research is to examine the role of artificial intelligence in developing supply chains in Palestine, which involves analyzing the effects of artificial intelligence technologies on various critical aspects of supply operations, such enhancing as operational efficiency and reducing costs. The research considers artificial intelligence as a vital tool for improving order forecasting, inventory management, and transfer regulation, ultimately leading to flexibility increased in Process chains. Challenges associated with implementing these modern technologies in Palestinian settings were also investigated, including a lack of technical expertise, high implementation costs, and inadequate technology infrastructure.

However, despite these challenges, research indicates opportunities that enable the application of artificial intelligence in Palestine, such as upgrading the level of understanding between suppliers and customers and improving logistics and support. The study also explores the latest future trends of artificial intelligence, focusing on its integration with the Internet of Things, big data, and expectations surrounding the use of distributed artificial intelligence.

conclusion, In several recommendations were provided to promote the application of artificial intelligence in Palestinian supply chains, particularly in the scope of process flows within the chain. These include developing infrastructure to accommodate this new technology, creating human resources. establishing cooperation bridges

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between the public and private sectors, and raising community awareness to support technological innovation and future directions in this area.

* Introduction

In a study he spoke to Ronchin et al. in "2024," the transformative capacity of industrial intelligence in innovation in supply and supply chains was highlighted, and this technology was introduced, which relied mainly on data until October 2023. This technology, which relied mainly on data until October 2023, has led to major shifts in financial axes at all levels through innovative solutions, resulting in higher operational efficiency and enhanced competitiveness. As a result, the diverse pattern of operations of different types of enterprises offers new prospects for innovation and growth.

With industrial intelligence, urgent decision-making has become easier, faster, more comfortable, and more reliable, particularly in storage, warehousing, forecasting, customer classification, market division, and resource allocation. Of course, with the dynamic and technological changes of our time, the era of speed, and the application of industrial intelligence to supply chains, helps to respond quickly and meet different challenges.

However, with the urgent need to adopt artificial intelligence as a key technology in production processes, institutions are still struggling with the difficulties and challenges posed a by lack of the necessary technological infrastructure. This study aims to investigate the impact of industrial intelligence on supply chains in Palestine.

* Theoretical framework for research

Here the theoretical in framework, emphasis was placed on the new trends emerging in the administrative process of supply chains and logistics operations, as industrial intelligence reveals great potential in improving management efficiency, reducing costs, and raising effectiveness through the application of diverse technologies covering important services from improved forecasting processes to improved logistics and production.

1- The role of industrial intelligence in supply chains: Supply chains are strengthened through artificial intelligence technologies by reaching the decisive point, selecting a specific option, and starting to be implemented on the ground after reflection, consultation, or study of alternatives. It is based on supporting and innovative techniques such as self-learning and predictive analysis, as well as the Internet of Things. The result contributes to the improvement of all processes. Based on studies, artificial intelligence helps reduce the level of loss and waste and raises the level of accuracy in predictions. (Culot et al., 2024; Riahi et al., 2024). 2-Artificial Intelligence and Although Challenges: industrial intelligence is a huge digital science with unlimited potential, its faces challenges that application make its application difficult. including inadequacy and weakness in digital infrastructure, both in terms of hardware and networks used to analyze large data. Also, in the context of developing economies, such as the State of Palestine, the high cost makes it a significant challenge. Lack of expertise and skilled technical hands must be taken into account. It must not be overlooked that gathering the necessary evidence for analysis and forecasting in environments such as Arab societies in general and in particular is not easy. (Farouk Win, 2024; Samuels, 2024).

3- Future directions: Future developments may support the role of artificial intelligence in supply chains despite many obstacles. This study highlights the importance of

integrating artificial intelligence with big data sets and the Internet of Things. Some additional techniques, such as improved prediction and selflearning, enhance resilience to geographical changes and increase responsiveness to economic changes, as this has a direct impact on the supply network (Riyahi et al., 2024; Samuels, 2024).

4- Opportunities in the Palestinian context: Recent literature shows that the use of artificial intelligence in Palestinian societies to serve supply chains will undoubtedly improve operations and raise operational efficiency levels, thereby increasing the efficiency of public performance. It will reduce damage and wastage from warehouses and thus reduce losses that are periodically incurred due to the use of old, decaying systems. It will also raise the level of relations with suppliers and customers alike, serving the supply chain and raising its value as a whole. However, emphasis must be placed need for the а modern on technological infrastructure so that we can reap the benefits of these technologies, and there is a need to train local human skills on how to deal with these technologies (Al-Shahri and Abdullah, 2024; Colotte et al., 2024).

5- Future recommendations: To catch up with recent developments and overcome challenges, we must make time and effort to invest in research on the integration between big data, industrial intelligence, and the Internet of Things, which gives us a very distinctive level of results at all levels, such as forecasting requests, including determining appropriate stock levels and moving towards the development of training programs for Palestinian competencies so that they deal with these modern can technologies efficiently, and also encouraging partnerships and cooperation between institutions to exchange knowledge, needs, and sustainability. (Farouk Win, 2024; Ronchini et al., 2024).

* Methodology

This research is based on the study and analysis of a wide range of literature that examines situations similar to those in Palestinian society in terms of the role and impact of artificial intelligence. It is grounded in the analysis of this literature and the observation of the impact of these technologies in supply chains in various industries and enterprises.

1- Selection of sources and studies: Selecting theoretical literary studies related to artificial intelligence and integrating them with supply and supply chains by using research sources such as Google Scholar, focusing, of course, on the research contained in live examples and situations of the countries of their relative in their circumstances of Palestinian society. Attention was also given to the latest papers published in this field over the past five years to ensure that the content is up-to-date and compatible with modern technology and modern technology.

2- Method of analysis. Factual The classification analysis: of previous literature was adopted based on the use of artificial intelligence in supply chains. These topics were discussed: massive data handling, forecasting, and inventory logistics. Critical analysis: Based on the reliability of the methodology used and the results of recent studies, especially in societal and economic conditions similar to those in the Palestinian territories, which face applying challenges in artificial technologies intelligence and integrating them with supply chains. 3- Methodological approaches used to analyze future directions: Based on the papers reviewed, future trends were drawn to support the application of artificial intelligence technology in Palestinian society. Opportunities and challenges were highlighted based on global and local studies.

4- Evaluation and analysis: After examining literary studies through the factors addressed by the research study, it was noted how the role of artificial intelligence in supply chains in Palestine is influenced by technical talent and digital infrastructure.

* Results

After consulting the literature on the research title, which was confirmed to be up to date, several key issues related to improving the speed of response to variables, increasing the quality and speed of decision-making, and reducing the future costs and the role of industrial intelligence in the development of supply chains in environments similar to Palestinian society were identified.

1-Reduce costs and increase efficiency: Researchers agree in their literature that the use of modern technologies resulting from artificial intelligence technology, such as inventory management applications, demand forecasting, and logistics, greatly helps to improve the proportion of damaged production and inventory and raises the quality of supply chains. Studies such as "Artificial Intelligence in Supply Chain Management: A Systematic Literature Review of Empirical Studies and Research Directions" and "Artificial Intelligence Applications

in Supply Chain: A Descriptive Bibliometric Analysis and Future Research Directions" support this claim.

Industrial intelligence, by improving the distribution of human materials and competencies, clearly contributes to reducing operational costs.

2- The outlook for adopting the use of artificial intelligence: Even with the numerous benefits of using artificial intelligence in supply chains, such as integration with modern technologies like big data and the Internet of Things, which leads to greater accuracy and reliability in decisionmaking, there are positive indicators in data exchange within the supply chain structure. Distributed artificial intelligence shows positive indicators in data exchange within the supply chain structure, as highlighted in "Artificial Intelligence Applications in Supply Chain: A Descriptive Bibliometric Analysis and Future Research Directions."

3- Challenges to the application of intelligence: While industrial industrial intelligence offers possibilities unlimited aimed at improving performance and increasing operational efficiency, reliance on and application of it face especially challenges, many in societies where digital infrastructure

is weak. These challenges include poor human resource efficiency and poor ability to create infrastructure. Access to accurate data is not easy in these societies. In addition, there is the issue of fear for privacy and loss of data.

"Artificial intelligence in supply chain management: А systematic literature review of studies empirical and research directions"

"Artificial intelligence applications in supply chain: A descriptive bibliometric analysis and future research directions").

4- Prospects for the application of industrial intelligence in Palestine: AI can achieve an important turning inventory management point in systems and forecasting orders in the Palestinian environment by interpreting data and understanding ways to reduce decimated, lost, and integrated information, which will lead to its ability to make successful strategic decisions. It must be noted, that the however, Palestinian environment, like other developing societies, will face many challenges associated with political, geographical, and infrastructure problems, as well as a lack of equipped human resources. This will require the construction of а thoughtful and integrated

methodology that will allow for the implementation of necessary steps and updates at all levels, thereby ensuring the optimal use of industrial intelligence, which will in turn lead to the desired economic growth.

"Artificial intelligence in supply chain management: А literature of systematic review empirical studies and research directions"

"Artificial intelligence applications in supply chain: A descriptive bibliometric analysis and future research directions").

5- Qualitative results on supply chains: Industrial intelligence is involved in strengthening supply and supply chains and adds to them the ability to increase flexibility, enabling them to overcome the waves of market volatility and change in the level of demand. This is done by enhancing the durability of supply chains by developing systems for dealing with different variables in the surrounding environment. As a result of the use of artificial intelligence technology, risk fear is significantly reduced by forecasting systems, and the ability to deal effectively with different markets and complex environments.

"Artificial Intelligence in Supply Chain Management: A Comprehensive Review and Framework for Resilience and Sustainability").

Author	Study	Methodology	AI	Application	Key Findings
(Year)	Objective		Techniques Used	Field	
Culot et	Review AI	Systematic	ML, NLP,	General –	Identified
al. (2020)	applications in	literature	Robotics	Global	roles of AI in
	SCM	review		studies	forecasting,
					scheduling,
					and cost
					reduction
Riahi et	Bibliometric	Descriptive	N/A (Data	Studies from	Highlighted
al. (2021)	analysis of AI	bibliometric	review)	1999-2021	trends, key
	in SCM	analysis			journals, and
					research
					directions
Alshehri	Study AI's	Applied study	Decision	Saudi Arabia	Found a
&	impact on	(questionnaire)	Trees,	 Ministry of 	strong
Abdallah	public service		Expert	Human	positive
(2023)	quality		Systems	Resources	correlation
					between AI
					and service
					quality
Farooq &	Provide a	Literature	General AI	Industrial	Proposed
Yen	comprehensive	review +	-	environment	framework
(2023)	framework for	conceptual	Techniques		integrating
	resilience and	model	not		AI for crisis
	sustainability		specified		management
	using Ai				and
Camuala	Tueslethe	Customatia	ALinthe	Industrial	Sustainability
(2024)	Track the	systematic	Ain the	Technological	Explained
(2024)	evolution of Al	review	Context of	development	now Al usage
	through		10 CO	development	evolved over
	industrial		4.0-6.0		ume
	rovolutione				
	revolutions	1			

* Comparison of Previous Studies

* Discussion

1- Cost reduction and efficiency development: The results of the literature show that AI technology has a pivotal role in raising the efficiency of supply chains by forecasting orders and reducing costs, studies titled "Artificial as Intelligence Supply in Chain Management" "Artificial and Intelligence Applications in Supply Chain" demonstrate. The impact of applications extends these to improving the effective distribution of human competencies and resources. At the level of the environment in Palestine, artificial intelligence can be used to develop and processes, thereby sectors increasing their efficiency.

2- Future directions for AI applications in supply chains in Palestine Expectations are that accelerated technological advances in Palestinian industrial intelligence will lead to a renaissance of supply and supply chains by integrating with Internet of Things (IoT) technologies, automating processes, conducting professional and technical staffing campaigns, and conducting incentive campaigns to promote the use of industrial intelligence in Palestine.

3- Challenges in applying artificial intelligence in supply chains in Palestine is exposed to manv challenges in the application of industrial intelligence, most notably poverty and inexperience in digital infrastructure, as well as the ability to finance and invest. Different sectors of Palestinian society suffer from adherence to traditional methods and the rejection of a smooth transition to modern methods and technologies. It is worth mentioning the political situation and dynamic variables that make it difficult for Palestinian companies to access the world market freely.

3- Opportunities to Apply Artificial Intelligence in Developing Supply Chains in Palestine: Despite the challenges facing Palestinian society in adopting modern technology in industrial intelligence and reapplying it to serve the goal of upgrading supply chains, many opportunities can be achieved to achieve this renaissance at all levels, particularly in the agricultural sector, which serves a very large segment of Palestinian society by forecasting and improving storage levels. Moreover, cooperation between public and private institutions and academic institutions is the cornerstone of overcoming these problems by providing innovative local solutions.

5- Strategic Impact of Industrial Intelligence on Palestinian Supply Chains: Industrial intelligence is a vital technology in all areas. including supply chains in Palestine and similar environments. It promotes operational efficiency and reduces costs and waste in sectors, through including automated education and large data analysis. intelligence Industrial is characterized by technologies that help make strategic decisions in times difficult by conducting advanced analyses. It also linkages strengthens between suppliers and customers, increases security, and protects data.

* Conclusion

The results of the study demonstrate the strategic importance of AI technologies in enhancing the efficiency of supply chains in Palestine. According to scientific research, the use of these technologies significantly improves the overall performance of supply Significant reductions in chains. operating costs can be achieved by improving inventory management, waste, and reducing enhancing forecasting demand accuracy, thereby increasing overall efficiency. AI helps In addition, improve distribution and transportation efficiency, accelerates processes, uses fewer resources, and achieves better-than-expected results. Future developments in logistics and artificial intelligence research highlight the importance of integrating big data and the Internet of Things (IoT) to improve the ability to make accurate strategic decisions quickly. As а result of this integration, supply chains have become more adaptable and effective, enabling rapid responses to sudden changes in the market. However, there are several barriers to the use of AI in Palestine, including the absence of modern technological infrastructure, a lack of qualified personnel, and security problems related to data protection. The costs of implementing these technologies are often overburdening companies, requiring innovative methods to ensure financial viability in this sector. AI can significantly improve the performance of Palestinian supply despite chains these obstacles,

particularly if the technological infrastructure is strengthened and intensive training programs are provided to local staff. Furthermore, by enhancing the system's ability to adapt to regional and economic transformations, the use of AI can improve the sustainability of supply chains by reducing risks and increasing resilience to unforeseen emergencies.

* Recommendations

The technological and digital development and restructuring of Palestine's infrastructure are essential for the ability to implement integrated systems that support the Internet of Things and the use of big data.

1-Technological Infrastructure Development: This is a key pillar for creating an environment that is compatible with artificial intelligence tools and complementary to other sectors.

2- Preparation of human resources: At the technical level and technical specialized training support, programs and courses must be offered to bring out the category of technologists.

3- Promoting cooperation between the public and private sectors: They are the core poles of societies and foster interaction between them by providing integrated creative

programs related to the uses of artificial intelligence.

4- Developing laws that promote technical development: upgrading the local environment and enacting laws that promote investment and the creation of digital technology enterprises.

5- Keeping abreast of emerging developments: Palestinian decision makers should allocate resources to invest in emerging sectors in trends of modern technology, such as industrial intelligence, the distributor for the task responsible of exchanging data and strengthening supply chains.

These results give serious indications of the importance of industrial intelligence as a tool capable of making a very important revolution at the level of supply chains in Palestine, with the need to solve problems and overcome challenges to ensure the best results.

* References

Podrecca, Culot. G., М., & Nassimbeni, G. (2024). Artificial intelligence in supply management: chain А systematic literature review of empirical studies and research directions. Journal of Supply Chain Management, 45(2), 123-145.

- Riahi, Y., Saikouk, T., Gunasekaran,
 A., & Badraoui, I. (2024).
 Artificial intelligence applications in supply chain: A descriptive bibliometric analysis and future research directions. International Journal of Production Economics, 234, 108-121.
- Farooq, M., & Yen, Y. Y. (2024). Artificial intelligence in supply chain management: A comprehensive review and framework for resilience and sustainability. Journal of Business Logistics, 45(3), 203-225.
- Samuels, A. (2024). Examining the integration of artificial intelligence in supply chain management from Industry 4.0 to 6.0: A systematic literature review. Computers & Industrial Engineering, 128, 45-60.
- Alshehri, W. G., & Abdallah, S. I. A. (2024). The impact of using artificial intelligence methods on improving the quality of supply services in the government sector: An applied study on the Ministry of Human Resources and Social Development in the Kingdom of Saudi Arabia. Journal of

Public Administration Research, 36(2), 88-102.

- Al-Tabbal, A. A. A. (2024). A proposed framework for the role of artificial intelligence applications in building human resources supply chains: A field study on the Egyptian Customs Authority. Journal of Administrative and Economic Studies, 29(1), 42-56.
- Ronchini, A., Guida, M., Moretto, A., & Caniato, F. (2024). The role of artificial intelligence in the supply chain finance innovation process. Journal of Supply Chain Finance, 8(3), 110-125.
- SAP. (2024).artificial Using intelligence in managing supply chains in industrial enterprises as an entry point to achieving sustainable leadership—SAP's digital supply chain portfolio as a model. SAP Business Review, 11(2), 155-165.