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L'intelligence artificielle dans les chaînes d'approvisionnement : une revue de la littérature sur ses liens avec la résilience de la chaine d'approvisionnement, capacités dynamiques, et la durabilité des chaînes d'approvisionnement, accompagnée d'une proposition de modèle conceptuel

Artificial Intelligence in Supply Chains : A Literature Review of Its Relationship with Supply Chain Resilience, Dynamic Capabilities, and Sustainability Supply chain, with a Proposed Conceptual Model

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Abstract

Today, supply chains facing vulnerabilities and repercussions in a complex environment are receiving are of particular interest to companies. Digital transformation is essential as a managerial practice for the operational level that enables it to ensure the smooth running of activities. The implementation of these technologies in companies presents challenges for a successful integration. The purpose of this study is to show the causal relationship between artificial intelligence and supply chain resilience, under the mediating variables of adaptive capabilities, supply chain agility, and supply chain collaboration.
This paper is a literature review based on a methodology, involving a narrative review to list and cites previous studies in this area using indexed search engines.
This study shows that artificial intelligence can improve supply, production, transport, decision-making and route management through data analysis and predictive modeling.
It enhances competitiveness by reducing costs, shortening delivery times, and improving quality and sustainability.

Key words: Artificial intelligence, Supply chain resilience, Industry 5.0, supply chain collaboration.

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Introduction

Supply chains face numerous risks, whether external or internal, due to an environment marked by turbulence and high vulnerability. The current context is characterized by a succession of crises with both positive and negative impacts, such as the COVID-19 pandemic and various geopolitical developments, including the Russia-Ukraine war and soaring diesel prices. In this context, stakeholders are striving to weather these challenges by building their resilience.

Today, companies face a major challenge: adapting to and integrating advanced technologies, which are considered a key factor for success in their industry. This enables them to maintain a competitive advantage in the face of competition. It highlights the importance of technology within an organization for improving its performance. From a certain perspective, internal resources—whether tangible or intangible—are the primary lever enabling a company to dominate its business ecosystem. There is a wide array of emerging advanced technologies, from their emergence during the Industry 1.0 era to the advent of Industry 5.0. At each stage, there has been an advancement in industrial techniques, leading to a final stage that is sustainable and resilient. Among these technologies is artificial intelligence, a key component of Industry 4.0. These are connected programs that behave similarly to humans and are capable of solving complex problems.

Some people confuse organizational resilience with supply chain resilience. Both concepts refer to the ability to foresee and anticipate unplanned situations and to recover from them by ensuring business continuity in an agile and flexible manner. The main objective of this article is to identify and synthesize previous studies on artificial intelligence and its impact on supply chain resilience. In addition, this paper aims to examine trends in the application of artificial intelligence in the supply chain over the 2015–2025 period . To address existing gaps in the literature, it is essential to break down the topic into sub-research questions: How does artificial intelligence influence supply chain resilience through adaptability, agility, and collaboration within the supply chain?

How does supply chain dynamism moderate the relationships between artificial intelligence and adaptability, as well as between artificial intelligence and supply chain collaboration?

To address the topic of artificial intelligence's application in the supply chain, two main theories are drawn upon: the theory of dynamic capabilities and the theory of organizational information processing. The outline is thus divided into four sections:

First, contextualize the supply chain in the era of new technological revolutions.

Second, to present the proposed methodology, which includes a qualitative narrative review.

Third, to examine the contribution of artificial intelligence to the supply chain.

Finally, to analyze and discuss the main findings.

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1. Literature review:

1.1. Theory of Dynamic Capabilities.

The theory of dynamic capabilities emphasises a firm's ability to develop, integrate and adjust its resources in order to adapt to changes in the external environment. This theory is closely linked to supply chain disruption (SCR) management, which aims to address supply chain disruptions in dynamic environments. Studies have shown that the development of dynamic capabilities is essentially a process aimed at improving the management of supply chain disruptions (Li & Sukhotu, 2025) . The core of supply chain resilience lies in maintaining the stability of the supply chain . By improving collaboration and visibility, firms can optimise the flow of information and the allocation of resources, enabling them to respond rapidly to external shocks and
optimise supply chain processes (Li & Sukhotu, 2025) .

On this basis, this study draws on dynamic capabilities theory to analyse the specific impacts of innovation capacity and absorption capacity, with adaptability mediating the relationship between artificial intelligence and supply chain resilience .

1.2. Organizational Information Processing Theory.

The Organizational Information Processing Theory (OIPT) provides a key framework
for addressing supply chain complexity (Li & Sukhotu, 2025). It suggests that improving real-time information processing capabilities can enhance performance when task uncertainty increases (Li & Sukhotu, 2025) .

Information processing needs arise from internal and external uncertainties in the supply chain and aligning these needs with processing capabilities ensures optimal performance (Li & Sukhotu, 2025). OIPT divides information processing into three key activities, namely
risk information sharing, risk analysis and assessment, and risk-sharing mechanisms,
which involve gathering data, transforming it into actionable knowledge, and coordinating decisions (Li & Sukhotu, 2025) . Digital capability acts as a crucial tool for information processing by integrating the collection, evaluation, and application of risk-related information, significantly improving risk management, reducing uncertainty, and strengthening SCR With advancements in technology, digital capability has become essential for enhancing responsiveness and risk management efficiency in dynamic and complex environments,further bolstering SCR (Li & Sukhotu, 2025).

According to Srinivasan and Swink (2018), firms depend on information to coordinate and execute tasks in high-uncertainty situations effectively. In managing tasks, firms can either minimize their dependency on information by enabling mechanistic structure or building capability for information processing(Ojo et al., 2023).

Information processing capability becomes inevitable in handling uncertainty to sustain a higher performance level (Dubey et al., 2019a) (Ojo et al., 2023).

Galbraith (1973, p. 5) defined "uncertainty as the difference between the amount of information required to execute a task and the level of information already available with the organization"(Ojo et al., 2023).

Grounded in OIPT, this study examines how entrprise inteligence artificielle optimizes supply chain collaboration and visibility,circulation of information transparency ultimately enhancing SCR.

1.3. Organizational Information Processing Theory.

An organization can develop its capabilities through the resources it possesses. The Resource-Based View (RBV) conceptualizes an organization as a collection of resources that can be integrated to create a competitive advantage. Resources are rare and unique assets that enable an organization to generate value and devise a strategy for producing economic rent (Barney, 1991) (Ojo et al., 2023).

This concept distinguishes between resource-picking activities and capability-building processes, with the aim of leveraging resources that provide a firm with a competitive advantage (Mikalef et al., 2018). Through resource-picking, an organization identifies the resources—tangible, human, and intangible—that are essential for achieving high performance. These are primarily non-specific, tradable assets; this stands in contrast to capabilities, which are specific, non-tradable aptitudes that emerge from integrating these identified resources into other processes to enhance firm performance (Makadok, 2001) (Ojo et al., 2023).

1.4. Artificial intelligence

Artificial intelligence is a combination of integrated systems that has the capability to perform tasks that usually resemble human intelligence (Pournader et al. 2021:2) (Hirsch et al., 2024). Artificial intelligence has gained attention due to the availability of big data and the analytical power of modern-day computing systems (Haenlein & Kaplan 2019:5) (Hirsch et al., 2024). Artificial intelligence has the capabilities to interact with and make sense of a variety of data, learn from the data, and also possess numerous decision-making capabilities (Pournader et al. 2021:2) (Hirsch et al., 2024). Many firms have not exploited these capabilities but are increasing their efforts to integrate this technology enabler into their supply chains.

Artificial intelligence can conduct environmental scanning by learning from the environment and processing external data (Aboutorab et al. 2022:110) (Hirsch et al., 2024). After scanning the external environment, AI can also create timely alerts so that the relevant personnel can respond in time (Aboutorab et al.2022:110) (Hirsch et al., 2024).

1.5. Supply Chain Resilient.

Supply chain resilience is a multidimensional and multidisciplinary concept that has received increasing interest among academic and practitioner communities yet lacks a generally accepted definition(Ojo et al., 2023). According to Brandon-Jones et al. (2014, p. 55), supply chain resilience is the "ability of a supply chain to return operating performance, within an acceptable period of time, after being disrupted." Market leaders like Nike and Lafarge Holcim have considered deepening collaboration with supply chain partners essential to building resilience(Ojo et al., 2023).. Hence, there has been a surge in research focused on supply chain resilience to enhance the organizational ability to adapt to unexpected disruptions and support operations continuity(Ojo et al., 2023).

1.6. Supply Chain Sustainability.

Broadly speaking, sustainability emphasizes effectiveness, and organizations incorporate sustainability strategies across all supply chain functions, spanning from sourcing materials and product design to manufacturing, warehousing, and distribution(Arabi et al., 2025). It may also include other aspects such as green warehousing, green construction supplier evaluation, selection of green suppliers, environmental protection, sustainable public transportation, and logistics optimization that are enablers of SSC (Arabi et al., 2025). Sustainability integrates

processes such as product design, production, distribution and restructuring processes that exist at the core of the supply chain (Arabi et al., 2025). With increasing attention and desire of consumers towards supplier sustainability, uncoordinated supply chains gradually move towards coordination, which increases cooperation between supply chain members (Arabi et al., 2025). Sustainable Supply Chain (SSC) management is equally crucial for the organization to establish competitive edges in areas such as cost-effectiveness, product quality, dependability, adaptability, and responsiveness (Arabi et al., 2025). Concerns raised by governmental and non-profit entities, environmental advocates, and the general populace regarding issues like global warming, the depletion of natural resources, overreliance on non-renewable resources, and the heightened industrialization in developed and emerging economies have prompted various stakeholders to shift their focus toward sustainable business practices(Arabi et al., 2025). Consequently, organizational, social, and environmental responsibility has evolved into a key objective for both production and service-oriented enterprises. Additionally, a multitude of external and internal factors have spurred organizations, particularly in the upstream segments of the supply chain, to embrace sustainable supply chain management (Arabi et al., 2025). External factors encompass legal mandates, the specific nature of the business, competitive pressures, and the interests of shareholders. Internally, the perspectives of top management, incentives for sustainable suppliers, and evolving customer preferences have all contributed to this shift (Arabi et al., 2025).

The benefits of implementing a SSC encompass enhanced customer satisfaction, heightened quality, increased innovation, greater trust, improved flexibility, better cost management, and optimized inventory levels. As the environmental impact of human actions continues to grow, the notion of sustainability has assumed paramount significance for organizations, governments, individuals, and notably, environmental advocates. Conversely, emerging technologies have the potential to bolster product life cycles, operational and system efficiency, sustainability monitoring and reporting, and the promotion of environmentally responsible practices(Arabi et al., 2025).

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2.Methodology:

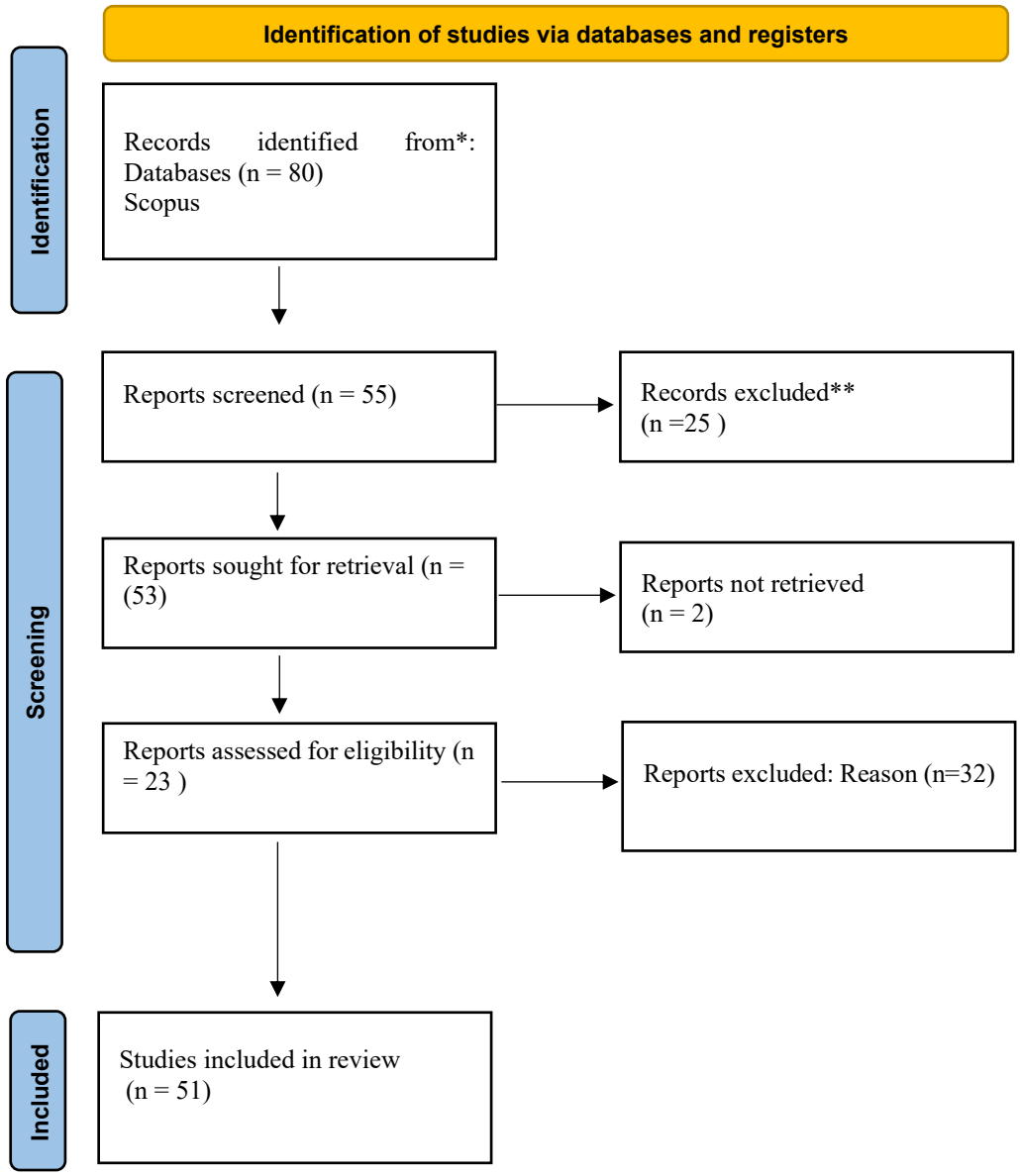

Figure 1: PRISMA Protocol

As part of our search strategy for the chosen search engine, we carried out the following search: TITLE-ABS-KEY (("artificial intelligence" OR "AI") AND ("supply chain resilience" OR "supply chains resilience"))

During this qualitative literature review, various search engines and databases were consulted, including Scopus, Google Scholar, Taylor & Francis, and other indexing platforms.

For our research, we ultimately chose to use the Scopus database because of its scientific rigor, the quality of the works it indexes, and the reliability of its indexing system, which provides a consistent and usable corpus. Data extraction was performed by examining the titles, keywords, and abstracts of the publications.

The time frame from 2015 to 2025 shows a growing—even significant—interest on the part of researchers and scientific committees in the concept of resilience. This increased attention is linked to the resulting emergence of synergies among crises, disruptions, and vulnerabilities in

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an environment dominated by the growing use of contemporary technologies such as blockchain, artificial intelligence, the Internet of Things (IoT), big data, and large-scale models. However, this approach has certain limitations. Excluding the most recent studies published in 2026 represents a significant constraint, as it excludes the most recent advances in the field from the corpus. Furthermore, relying solely on Scopus, without comparing it to the Web of Science database, could limit the scope of the literature covered.

Finally, the emphasis on management, business, economics, and finance—at the expense of mathematics, computer science, and information technology—limits the technical scope of the research examined.

Table 1: Inclusion and Exclusion Criteria of This Study

Criteria	Inclusion Criteria	Exclusion Criteria
Type of references	Article, conference paper, journal	Edited volumes, internal reports, unpeer-reviewed articles, press articles
Years coveed	2015-2025	Publications outside the selected period
Language	English	French, Spanish, German
Databases consulted	Scopus	Other databases
Selected keywords	Intelligence artificielle, supply chain	Other keywords
Basic Boolean operators	AND	OR,NOT
Scope of the study	Supply chain	Other areas

Source: Authors' own elaboration

To overcome the known limitations of narrative reviews (Tranfield et al., 2003) or expert reviews based on an ad hoc selection of the literature (Kitchenham et al., 2009), this study adopted a mixed-methods approach. First, it conducted a literature review based on a documentary analysis. According to Denyer and Tranfield (2009), this approach includes a pilot study during the first phase to gain an in-depth understanding of the current literature, define the criteria for selecting publications, and formulate the research question as well as the subsequent steps.

A literature review is a comprehensive summary of previous research on a topic, drawn from scientific articles, books, and other sources relevant to a particular field of research.

Essentially, it serves as a guide for the reader, providing a comprehensive understanding of developments in the field as presented in the literature.

A non-systematic narrative review is a conventional “narrative” literature review that provides an informal synthesis and discussion of a given topic. It is based on a review of the existing literature that is not necessarily systematic or exhaustive. This method helps to update and critically evaluate knowledge on a specific topic, with the goal of identifying relevant publications. It provides an overview of a specific topic, highlights issues that are often overlooked, and encourages further research in this field.

Relationships betewen AI and supply chain resilience

The fundamental principle behind the application of AI in supply chain management (SCM) lies in enhancing the autonomous and predictive capabilities of supply chains, thereby

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generating significant efficiency gains within an increasingly complex and uncertain environment (Calatayud, Mangan, and Christopher 2019)(Ekezie et al., 2026). It can be applied to various supply chain strategies and activities, including logistics network design, supplier selection, inventory planning, demand forecasting, and sustainable SCM (Sharma et al. 2022). Consequently, AI-driven innovation in supply chains has reshaped traditional practices, optimized processes, and created unprecedented opportunities for companies to thrive in a rapidly evolving landscape across a variety of domains (Belhadi et al. 2021; Hendriksen 2023) (Ekezie et al., 2026).

Previous research indicates that AI-driven innovation in supply chains (SCs) can be leveraged to foster SC resilience (Belhadi et al. 2021) (Ekezie et al., 2026), collaboration within the SC (Bag et al. 2023) (Ekezie et al., 2026), and sustainable supply chain management (SCM) (Naz et al. 2022) (Ekezie et al., 2026. Furthermore, AI can be utilized for demand forecasting and inventory optimization (Sharma et al. 2022) (Ekezie et al., 2026) to reduce costs, increase customer satisfaction, and lower environmental impact by minimizing waste. It also enables real-time visibility across the entire supply chain, facilitating proactive decision-making, rapid response to disruptions, and improved risk management (Belhadi et al. 2021) (Ekezie et al., 2026). Such AI-based innovations are fundamentally transforming contemporary supply chains and SCM. Through its potential to optimize processes, enhance visibility, and mitigate risks, AI-driven innovation empowers companies to build agile, efficient, and resilient supply chains capable of addressing various challenges and seizing opportunities as they arise.

However, despite the advancements AI offers in areas such as SC resilience, collaboration, and sustainability (Bag et al. 2023; Belhadi et al. 2021; Naz et al. 2022) (Ekezie et al., 2026), current research has yet to fully examine its impact on the human aspects of supply chains—particularly in scenarios where AI risks replacing frontline employees (Ekezie et al., 2026).

Table 2: Empirical Studies Related to Artificial Intelligence in Supply Chains

Study / Author	Year	Methodology	AI Application in the Supply Chain	Results and Practical Implications
Urenna Nwagwu, Moazam Niaz, Matthew Uchenna Chukwu, Fahad Saddique	2023	Quantitative	The impact of artificial intelligence on supply chain performance, facilitated by collaboration within manufacturing and logistics organizations in Pakistan.	The application of artificial intelligence has a significant influence on supply chain performance. Furthermore, collaboration within the supply chain partially mediates the relationship between AI and supply chain performance.
Ayman Wael Al-Khatib, Moh' Anwer Al-Shboul, Mais Khattab	2024	Quantitative	Generative artificial intelligence capabilities (GAIC) affect digital supply chain performance (DSCP).	A direct, positive, and statistically significant relationship exists between exploratory innovation and digital supply chain performance, with innovation ambidexterity playing a mediating role in the impact of generative AI technologies.

BARAKAT OUAFA, BOUANBA NOUHAYLA	2023	Qualitative	The key determinants of artificial intelligence adoption in industrial supply chains: management support, trust, the competitive environment, and security.	Four main determinants of AI adoption in supply chains.
Lin Lu, Ping Long, Xiaochun Luo	2024	Mixed	The application of artificial intelligence improves supply chain resilience.	The study showed that the resilience of the forest products supply chain can be improved through the application of artificial intelligence and extension theory. Integrated and e-commerce-led supply chains demonstrated excellent resilience, while supplier-led supply chains demonstrated good resilience.
Mohammad Ali Yamin*, Sultan Dakhilallah Almuteri, Khaled Jamil Bogari and Abdulrahim Khaled Ashi	2024	Quantitative	Introducing or improving the use of artificial intelligence within the supply chain can help improve its responsiveness, flexibility, and ability to adapt quickly to changes, which is at the core of agility.	The study is cross-sectional and examines the phenomenon at a given point in time. Other HR practices, such as recruitment and training, could play an important role in supply chain agility and resilience.
Shuang Tian, Lin Wu, Maria Pia Ciano, Marco Ardolino*, Kulwant S. Pawar	2024	Quantitative	AI acts as a transformational factor, optimizing both innovative processes and operational outcomes in the supply chain.	Datafication positively influences innovation capability and supply chain performance, with supply chain resilience playing a mediating role in this impact. These findings contribute to the ongoing debate on how digital technologies can help organizations improve supply chains and achieve a competitive advantage.
Lijie Lin and Xiangyu Zhang	2025	A strictly quantitative and empirical methodology	Automates routine tasks via a "machine-replacing-human" substitution effect, optimizing production processes and workflow efficiency. Uses AI customer profiling and demand estimation to minimize stockouts and	Enterprise AI has a statistically significant positive impact on supply chain resilience (benchmark coefficient = 0.0035, $p < 0.01$). Information transparency, innovation capability, and absorptive capacity serve as partial mediators in the

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			inventory buildup, reducing warehousing costs. Dismantles information silos, enables end-to-end real-time data sharing between upstream suppliers and downstream customers, and mitigates the bullwhip effect	relationship between AI and supply chain resilience. Digital governance positively moderates this relationship, meaning higher regional digital governance amplifies the positive impact of enterprise AI on supply chain resilience.

Source: Authors' own elaboration

3. Theoretical Analysis and Hypothesis Formulation.

3.1. Enterprise Artificial Intelligence and Supply Chain Resilience.

In contrast to other digital technologies, AI, as a strategically emergent technology, has attributes such as profound penetration, extensive substitution, and significant innovation, which enhance the collaborative synergy between upstream and downstream entities within the supply chain(Lin & Zhang, 2025). It enhances industries by providing collaborative operational capabilities, adaptable ecological networks, and intelligent economic activities, ensuring the stable functioning of the supply chain system and the generation of different values(Lin & Zhang, 2025). The effectiveness of AI in information processing and information sharing is considered a key factor in building supply chain resilience [15]. It not only offers data support for risk identification and response throughout all supply chain segments but also functions as the foundational architecture facilitating the transition of supply chains into ecological supply networks. In the process of AI-driven transformation toward ecological supply networks, cross-border entities participate in economic activities through collaborative means. Intelligent platforms establish ecological partnerships among cross-border entities, strengthening inter-enterprise communication and cooperation to enhance information processing efficiency and drive supply chain value creation (Lin & Zhang, 2025). Additionally, leveraging intelligent technologies, AI can enable end-to-end collaboration across the entire supply chain. During the manufacturing phase, AI, owing to its relative superiority over human labor in performing regular activities, might create a “machine-replacing-human” substitution effect on corporate labor demand (Lin & Zhang, 2025) . Intelligent systems efficiently complete repetitive tasks, reducing human involvement in the production process and driving the transformation of traditional production processes toward automation and intelligence. Additionally, AI can evaluate the value of different alternative solutions to achieve the most optimal expected outcomes (Lin & Zhang, 2025) . In inventory management, AI-based customer profiling reduces inventory buildup and stockouts, thereby cutting warehousing costs. In logistics and transportation, companies utilize AI to design intelligent logistics systems that provide real-time updates on transportation status, connecting production and consumption endpoints to enhance logistics management efficiency. In the marketing phase, AI empowers the entire process across four dimensions—product, price, promotion, and channel—to help companies achieve better marketing outcomes (Lin & Zhang, 2025) . Specifically, in the product dimension, AI technology helps companies shorten product development and testing cycles and optimize product design (Lin & Zhang, 2025); in the price dimension, intelligent algorithms can accurately construct consumer profiles to achieve dynamic, personalized pricing ; in promotions, by intelligently analyzing consumer preferences, intelligent technology can help

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marketers generate high-quality marketing copy and targeted marketing content . In terms of channels, artificial intelligence provides new avenues for connecting upstream and downstream enterprises. Interactive intelligent technologies, with their significant advantages in pattern recognition and real-time decision-making, can enhance the engagement and loyalty of downstream enterprises (Lin & Zhang, 2025) . With AI technology, enterprises can integrate information from multiple industries and stages to achieve collaborative operations across all supply chain stages, thereby enhancing supply chain resilience.:

Hypothesis 1.

Enterprise artificial intelligence can enhance supply chain resilience.

4.2. The Mediating Role of Information Transparency on Enterprise Artificial Intelligence and Supply Chain Resilience.

Information transparency, a fundamental aspect of information sharing and collaborative decision-making, bolsters supply chain resilience via three avenues: improving data visibility, establishing trust mechanisms, and refining dynamic collaboration. In enterprises, intelligent technologies expedite information exchange among departments, successfully reducing problems like information distortion and misrepresentation, facilitating data sharing, and improving supply chain management and optimization capabilities (Lin & Zhang, 2025). Data visibility has been enhanced (Lin & Zhang, 2025). Management's ability to exploit asymmetric information for non-compliant operations has been weakened, thereby curbing opportunistic behavior, reducing transactional uncertainty, strengthening trust among supply chain stakeholders, and improving supply chain resilience (Lin & Zhang, 2025). The "spotlight effect" of AI technologies makes corporate management practices and market performance more visible to external markets.

External markets can now monitor enterprises in real time with unprecedented depth and breadth (Lin & Zhang, 2025). In this context, information barriers between upstream and downstream supply chain participants are effectively dismantled. Enterprises can establish comprehensive communication systems, accelerate the dissemination of supply chain information, and mitigate internal information asymmetry within the supply chain. Toorajipour et al. (2021) (Lin & Zhang, 2025) .

Hypothesis 2.

Information transparency plays an intermediary role between artificial intelligence and supply chain resilience.

4.3. The Mediating Role of Dynamic Capabilities on Enterprise Artificial Intelligence and Supply Chain Resilience.

Dynamic capabilities are crucial for building supply chain resilience as they enable enterprises to establish sustainable competitive advantages in uncertain environments(Lin & Zhang, 2025). Wang and Ahmed (2007) (Lin & Zhang, 2025) argue that dynamic capabilities consist of three elements: innovation capability, absorption capability, and adaptability. Innovation capability refers to an enterprise's ability to develop new products, explore new markets, and align its resources with market demands. Absorption capability refers to an enterprise's ability to identify, absorb, transform, apply, and create knowledge to solve problems. Adaptive capacity refers to a company's ability to adjust internal elements such as organizational structure to adapt

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to external environments. As an emerging strategic digital technology, artificial intelligence can enhance supply chain resilience by strengthening these three elements (Lin & Zhang, 2025). Specifically, artificial intelligence possesses information capture and resource integration capabilities (Lin & Zhang, 2025). It not only provides data elements for corporate innovation but also enhances a company's ability to integrate and utilize innovative resources such as technology and knowledge, thereby improving its innovation capabilities in areas such as technology, processes, and organization. Technological innovation helps enterprises identify risks in advance through technical means and formulate countermeasures, thereby effectively enhancing the supply chain's "shock resistance" capabilities. Process innovation equips firms with enhanced agility, allowing rapid adjustments to products and services in reaction to market demand fluctuations, thus mitigating supply-demand imbalances. Organizational innovation deepens the breadth and depth of cooperation among upstream and downstream enterprises in the supply chain, fortifies supply chain collaboration, and improves supply chain resilience. In a digital ecosystem, artificial intelligence can address the "time lag" and "partiality" issues in external knowledge acquisition by expanding information boundaries and improving knowledge processing efficiency, thereby strengthening absorption capacity(Lin & Zhang, 2025). Absorption capacity helps enterprises more efficiently convert external knowledge into internal capabilities, enabling them to more sensitively perceive changes in market demand, promptly adjust business strategies, and avoid potential risks. More importantly, absorption capacity enables companies to learn from crises and further transform these lessons into practical innovation strategies (Lin & Zhang, 2025), promoting technological synergy across the supply chain and enhancing supply chain stability (Lin & Zhang, 2025). Moreover, AI utilizes real-time data acquisition and astute market demand analysis to assist companies in mitigating the delays inherent in conventional decision-making, allowing for swift responses to abrupt fluctuations in demand, policy disruptions, and other external environmental shifts, thus improving their adaptability. Adaptability allows organizations to rapidly modify their operational plans in response to industry trends, technical innovations, and market fluctuations, while enhancing production factors to save costs and ensure adequate backup resources to avert supply chain interruptions (Lin & Zhang, 2025).

Hypothesis 3a.

Innovation ability plays an intermediary role between artificial intelligence and supply chain resilience.

Hypothesis 3b.

Absorptive capacity plays a mediating role between artificial intelligence and supply chain resilience.

Hypothesis 3c.

Adaptability plays a mediating role between artificial intelligence and supply chain resilience

4.4. The Moderating Role of Supply Chain Dynamism in the Relationship Between Supply Chain Resilience and Supply Chain Sustainability.

Supply chain dynamism is essential to this relationship; the ability of a supply chain to responsively and effectively cater to changes in the market can positively moderate the relationship between supply chain resilience and sustainability (Ali et al., 2024). In simple terms,dynamism allows a supply chain to change quickly and effectively in response to shifts

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in demand, supply, or environmental conditions, thus allowing a supply chain to maintain the flows of service, cut waste, and reduce its environmental burden in times of disruption (Ali et al., 2024). Most crucially for sustainability, dynamism allows firms to shift from reacting to a disruption to reconstituting the flows of service quickly, or even to react to a disruption in an ongoing fashion, such as through the use of renewable energy sources or the reduction in packaging waste (Ali et al., 2024). Consequently, the positive moderation effect of supply chain dynamism on resilience in sustainability suggests that the more dynamic a supply chain is, the better it can cope with disruptions, and the better it can effectively operationalize activities, which results in more sustainable operations, resulting in the development of a more sustainable business model and a healthier planet (Ali et al., 2024).

Hypothesis 4.

Supply chain dynamism positively moderates the relationship with supply chain resilience.

4.5. The impact of supply chain resilience for supply chain sustainability.

A resilient supply chain also cares about the environment: it favors local sourcing of raw materials, minimizes waste, optimizes delivery routes to reduce carbon impact, and prioritizes efficiency and the judicious use of resources, with the aim of maximizing the profits generated from the resources the company has committed (Atieh et al., 2024).

The goal of strengthening resilience encourages innovation and adaptation, which fosters the development of more sustainable technologies and practices (Atieh et al., 2024). Moreover, it encourages the involvement of stakeholders, customers, staff, and communities in initiatives that contribute to the implementation of sustainable practices (Atieh et al., 2024).

As a result, supply chain resilience is a key element of sustainability, encouraging companies to build supply chains that are not only resilient but also contribute to environmental conservation and social responsibility (Atieh et al., 2024).

Hypothesis 5:

Supply chain resilience has a positive impact on supply chain sustainability.

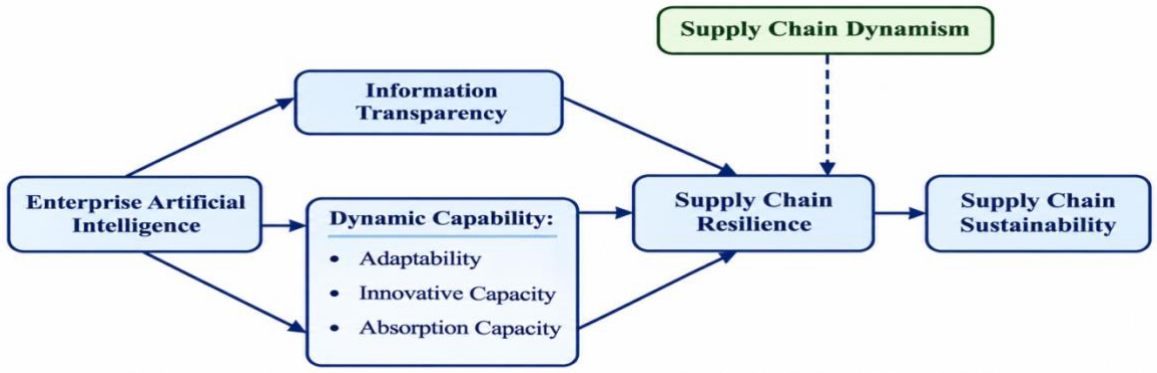

Figure 2: The Proposed Conceptual Model

Source: Authors' own elaboration

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Conclusion

Finally, this recent study examines the role of artificial intelligence entreprise in supply chain resilience and is structured around two methodological approaches: a qualitative approach consisting of a literature review (narrative component) and the development of a conceptual model that highlights the following variables:

- Entreprise artificial intelligence impacted for resilience supply chain.
- The information Transparency enhacing betewen Entreprise artificial intelligence and resilience supply chain
- Supply chain capability acts as a mediating Catalyst between Entreprise artificial intelligence and resilience supply chain.
- Supply chain resilience impacted for sustainability supply chain.
- Supply chain dynamism acts as a moderating factor between resilience supply chain and sustainability supply chain.

The use in a scientific methodology: 1) The qualitative narrative review, which aims to construct and establish the foundations regarding the role of artificial intelligence in the resilient supply chain through dynamic capabilities: organizational flexibility, adaptive capacity, agility, and collaboration.

It is difficult to derive managerial implications that would make it possible to generalize the results for the benefit of supply chain executives and managers, particularly due to the absence of hypothesis testing against a corpus of the articles.
It is important to emphasize that each section presents notable strengths while also containing gaps that will need to be addressed in future research.

Limitations:

- Absence of a scientific protocol based on inclusion and exclusion criteria to identify all relevant articles.
- Non-use of NVivo in the analysis of the narrative review: The absence of NVivo in the analysis could limit the ability to systematically organize and code qualitative data.
- Absence of an empirical field study: It is essential to incorporate a field study to confront and test all the hypotheses derived from the literature review.
- Non-determination of the targeted geographical area: It is essential to specify a particular geographical area, as each context of artificial intelligence application contributes differently.
- Non-determination of the target sample: It would be preferable to identify the target population before determining the sample.
- Non-generalizability of the results: The results obtained from the literature review and bibliometric analysis cannot be generalized to all entities.

Perspectives:

- Using other study variables: Include other variables related to agility, collaboration, and others capabilities, as well as factors such as technological innovation, risk management, information system efficiency, or the impact of emerging technologies (such as the Internet of Things or blockchain) on supply chain resilience.
- Comparative study across different business sectors: Conduct a comparative study of the impact of artificial intelligence on supply chain resilience across various business sectors (for example, distribution, the automotive industry, and the agri-food industry) to determine whether certain sector-specific characteristics influence the effectiveness of these technologies.
- Precise sample and generalizable results: To ensure the rigor and relevance of the study, it is essential to clearly define the target sample in order to generate reliable and generalizable results while taking into account the specific characteristics of the context and the research objectives.
- Use of advanced analytical tools and methods: To strengthen the robustness of the results and improve the validity of the conclusions, it is recommended to use advanced statistical analysis methods and specific tools such as SmartPLS, R, or EViews.

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