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A Systematic Literature Review on the Use of AI to Improve Management-Supplier Relationships

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ARTICLE INFO	ABSTRACT
Article History: Submitted: 08 February 2025 Reviewed: 21 June 2025 Revision: 09 January 2026 Accepted: 9 March 2026 Publish: 30 March 2026 Keywords: Artificial Intelligence (AI), Supplier Relationship Management, Supply Chain Management, Predictive Analytics, Machine Learning Corresponding Author: Titi Hardiyati email: hardiyatititi@gmail.com¹	The application of Artificial Intelligence (AI) in improving Supplier Relationship Management (SRM) is crucial. Although there is extensive research on AI applications, efforts to systematically review this specific research topic present a challenge because many initiatives have failed to improve supplier relationship management through the use of AI. Therefore, this study aims to conduct a systematic literature review focused on the transformative role of AI in fostering collaboration, transparency, and efficiency across the modern supply chain. The review process encompasses three main methodological steps: the review framework, the formulation of research questions, and a systematic data search strategy (identification, screening, eligibility assessment, quality assessment, as well as data extraction and analysis). Drawing insights from 12 (twelve) research articles, this review highlights the significant contributions of AI-based technologies—such as predictive analytics, natural language processing, and machine learning—to supplier selection, communication, risk management, and real-time feedback. These findings underscore AI's capacity to enhance trust and adaptability through adaptive decision-making and data-driven strategies, enabling personalized approaches and robust relationship management. While significant progress is evident, challenges such as technology adoption, integration complexity, and the digital divide remain.

INTRODUCTION

Artificial Intelligence (AI) has attracted significant attention from practitioners and researchers. Artificial intelligence is being integrated into various business functions in this era of digital transformation. AI technology is transforming the supply chain management landscape, particularly supplier relationship management, which is a key area for change. The increasing complexity of supply chains worldwide has heightened the need for innovative solutions. AI is used to enhance trust, efficiency, and better supplier collaboration (Belhadi et al., 2021; Alshurideh &

Associates, 2024). Therefore, this study focuses on how AI can influence supplier relationship management.

Supplier relationship management is considered essential for maintaining a competitive advantage in the global market. Building strong supplier relationships is crucial for ensuring efficient resource allocation, on-time delivery, and risk mitigation. Traditional approaches to supplier relationship management face challenges in adapting to changing market conditions. Inefficient communication mechanisms and limited real-time insights are the primary reasons for this (Ivanov et al. and Dash & Co., 2019). Due to these limitations, organizations have turned to AI-based solutions that can enhance decision-making processes and create an adaptive supply chain ecosystem.

The use of AI in supply chain management has been extensively studied by various academics, who have provided valuable insights into its potential. Kumardan et al. (2020) noted the use of machine learning and natural language processing to improve supplier selection and evaluation and enable organizations to assess suppliers holistically. Belhadi et al. (2021) also noted the use of predictive analytics to reduce risk and improve supply chain resilience. Collectively, these studies highlight the importance of AI in bridging gaps in supplier relationship management practices, particularly in reducing inefficiencies and enhancing trust among supply chain stakeholders.

In addition to operational efficiency, AI also contributes to supplier relationship management. Brynjolfsson and McAfee (2017) have shown that AI can help make informed decisions when processing data. This enables organizations to anticipate issues related to the supply chain and take proactive measures. Furthermore, the use of AI in interactions between customers and suppliers has been shown to improve communication and engagement. Alshurideh et al. (1924) state that AI technologies such as real-time feedback mechanisms and sentiment analysis can improve relationships with suppliers by fostering transparency and trust. These developments provide organizations with a tactical advantage in managing supplier relationships in highly competitive markets.

Although AI is used in supplier relationship management, there are still key issues that need to be addressed. The adoption of AI technology continues to be hindered by various challenges. These challenges include the digital divide, integration complexity, and ethical use (Riad et al., 2024). In addition, many companies struggle to integrate their current systems with modern AI tools. In supplier relationship management, integration can be hindered by high implementation costs and a lack of skilled personnel, as noted by Helo and Hao (2022). It is crucial to address these issues if we are to see results from the use of AI that can transform supplier relationships.

Drawing on twelve articles, this study synthesizes findings from previous research that examines how AI is integrated into in supplier relationship management. This systematic literature review examines trends, challenges, and opportunities related to AI-based supplier relationship management. This study provides a comprehensive overview of the impact of AI on supplier relationship management practices by consolidating knowledge from various fields and contexts.

Furthermore, this review process raises one main research question: "How is AI used to improve supplier relationship management?" The objective of this study is to examine the impact of AI technology on supplier selection, communication, risk assessment, and relationship optimization within the supply chain. By conducting this research, the intended goal is to advance the academic discussion on AI in supplier relationship management and provide practical insights for practitioners navigating the digital transformation of their supplier networks.

RESEARCH METHODOLOGY

2.1 Formulation of Research Questions

The research questions for this systematic literature review (SLR) were developed by integrating insights from previous research and applying the Population-Interest-Context (PICO)

framework, as recommended by Lockwood et al. (2015). This framework ensures a structured and systematic approach to identifying and refining the research focus.

The Population (P) in this systematic literature review refers to organizations and industries that rely on supplier relationship management to maintain operational efficiency and competitiveness. The Interest (I) section focuses on the role of Artificial Intelligence (AI) in optimizing supplier relationship management practices, including supplier selection, communication, risk management, and collaboration. Finally, the Context (Co) section covers the adoption of AI technology within the supply chain ecosystem, with a focus on its impact in dynamic and competitive markets.

In formulating the research questions, findings were drawn from previous studies. For example, Alshurideh et al. (2024) explored the application of AI in enhancing customer-supplier relationships in the banking sector, providing a conceptual model that emphasizes AI's ability to foster communication, trust, and adaptability. Additionally, findings by Brynjolfsson and McAfee (2017) and Belhadi et al. (2021) highlight the impact of AI transformation on predictive analytics and risk management in the supply chain. These studies, along with several others, were selected, resulting in a total of twelve (12) research articles that form the focus of this systematic literature review.

These research questions aim to explore how AI technology contributes to improving supplier relationship management practices, particularly in areas such as supplier evaluation, real-time communication, decision-making, and risk mitigation. These questions are then used to identify the challenges and opportunities associated with AI adoption in SRM, as highlighted in leading journals and other relevant studies.

This framework ensures that this systematic literature review systematically addresses the current state of knowledge while identifying gaps for future exploration. A structured approach using PICO, combined with insights from previous research, provides a solid foundation for analyzing the role of AI in enhancing supplier relationships within today's digitally transforming supply chain landscape.

2.2 Systematic Search Strategy

To answer the research question, "How is AI used to improve supplier relationship management?", this study employed a systematic search strategy consisting of five main processes: identification, screening, eligibility assessment, quality assessment, and data extraction and analysis. This structured approach was adapted from Shafril et al. (2018) and was designed to ensure a comprehensive and transparent process for selecting relevant articles.

2.2.1 Identification

The initial phase involved identifying relevant studies through a systematic keyword search on Google Scholar, given its extensive database of academic articles. The search strategy utilized three main keywords: Artificial Intelligence (AI), supplier relationship management, and improvement. The keywords were expanded using synonyms, related terms, and variations based on online thesaurus tools, expert opinions, and references from previous research. This section also includes terms or phrases such as AI in the supply chain, AI in supplier collaboration, supplier management optimization, AI technology in supplier relationship management, and customer-supplier relationships.

To improve search efficiency, conjunctions (e.g., AND, OR, IN, etc.) are used in conjunction with terms or phrases (e.g., "supply chain" or "artificial intelligence in supplier management"). Google Scholar is very useful for suggesting related articles and identifying studies that are frequently cited by others. This strategy yielded approximately 200 articles, which were then further refined through manual screening to ensure their relevance to the research topic.

2.2.2 Screening

During the screening stage, articles were evaluated for relevance and quality based on inclusion and exclusion criteria. The inclusion criteria required for this systematic literature review include:

- Directly address the role of AI in improving supplier relationship management
- Empirical or conceptual research articles published between 2015 and 2024 to ensure relevance to the latest technological advancements
- Written in English
- Having undergone peer review or originating from credible academic publications.

Articles that were not selected are those that focus on irrelevant topics (for example, general supply chain optimization without mentioning supplier relationship management) or do not provide an in-depth discussion of the application of AI in supplier relationships.

After applying these criteria, 12 articles were selected as the most relevant and high-quality sources for this systematic literature review. Among these sources, the article titled “Utilizing Artificial Intelligence (AI) to Enhance Customer-Supplier Relationships: An Exploratory Study in the Banking Industry” was selected as the primary journal article due to its significant focus on the application of AI in fostering customer-supplier engagement and communication within a specific industry context.

2.2.3 Eligibility

The final stage of the systematic search strategy involved ensuring the eligibility of the selected articles for in-depth analysis. This involved: The final stage of the systematic search strategy for this systematic literature review involved assessing the eligibility of the selected articles for subsequent in-depth analysis. This process included:

- Assessing the methodology of each article to ensure its accuracy and reliability.
- Evaluating the scope of the AI applications discussed, such as predictive analytics, real-time feedback, natural language processing, and risk management.
- Ensuring alignment with the research questions and relevance to supplier relationship management.

Using a structured search strategy and a rigorous screening process, this systematic literature review lays a solid foundation for answering the research question: “How is AI used to improve supplier relationship management?”

2.2.4 Quality Appraisal

The quality assessment process was conducted to ensure the methodological rigor and analytical reliability of the selected studies by aligning them with the research question: “How is AI used to improve supplier relationship management?” This step is essential to ensure that the selected articles provide high-quality insights into the role of AI in supplier relationship management (SRM).

To achieve this, the Mixed-Method Appraisal Tool (MMAT) by Hong et al. (2018) was used. The MMAT is a widely used framework designed to evaluate various study designs, including qualitative, quantitative, and mixed-methods research. The appraisal process began with an initial screening in which each article was reviewed to ensure that it met the inclusion criteria outlined in the previous section. Only studies relevant to the research questions that demonstrated methodological transparency and alignment with the scope of this systematic literature review were included in the quality assessment stage.

During the detailed quality assessment, each study was evaluated based on its specific methodological approach. For qualitative studies, the focus was on the appropriateness of the research questions, the coherence among data sources, the adequacy of data collection methods, and the consistency between analysis and interpretation. Quantitative studies are assessed based on the relevance of their sampling strategies, the representativeness of their samples, the appropriateness of their measurement techniques, and the rigor of their analyses. Mixed-methods

studies are evaluated based on the rationale for combining methods, the effectiveness of integrating qualitative and quantitative findings, and their ability to address differences between methodologies.

Each study was assessed based on five main criteria, and the evaluation was categorized as “yes,” “no,” or “don’t know/cannot answer.” To be included in the final review, a study had to meet at least three of the five criteria. Articles that meet all five criteria are considered exemplary, while those that meet four criteria are considered very good. Any discrepancies in assessment are resolved through discussion among the research team to ensure decisions are based on consensus.

Of the 12 articles reviewed, only five (including the lead article titled “The Use of Artificial Intelligence (AI) in Enhancing Customer-Supplier Relationships: An Exploratory Study in the Banking Industry”) met all five criteria. All 12 articles demonstrated excellent methodological and analytical rigor. Four of these articles met four criteria, indicating a strong alignment with the research questions and methodology. The remaining three articles met three criteria, providing well-presented insights despite minor limitations in their methodological approach.

In conclusion, this quality assessment ensures that only methodologically sound studies are included in the final review. By strictly applying the MMAT, this systematic literature review guarantees the reliability and validity of the literature selected to answer the research question, “How is AI used to improve supplier relationship management?” This process provides a solid foundation for generating meaningful conclusions and recommendations. Figures 1 and 2 show the flowchart of the entire search process and the PRISMA diagram for the literature selection process in writing this systematic literature review.

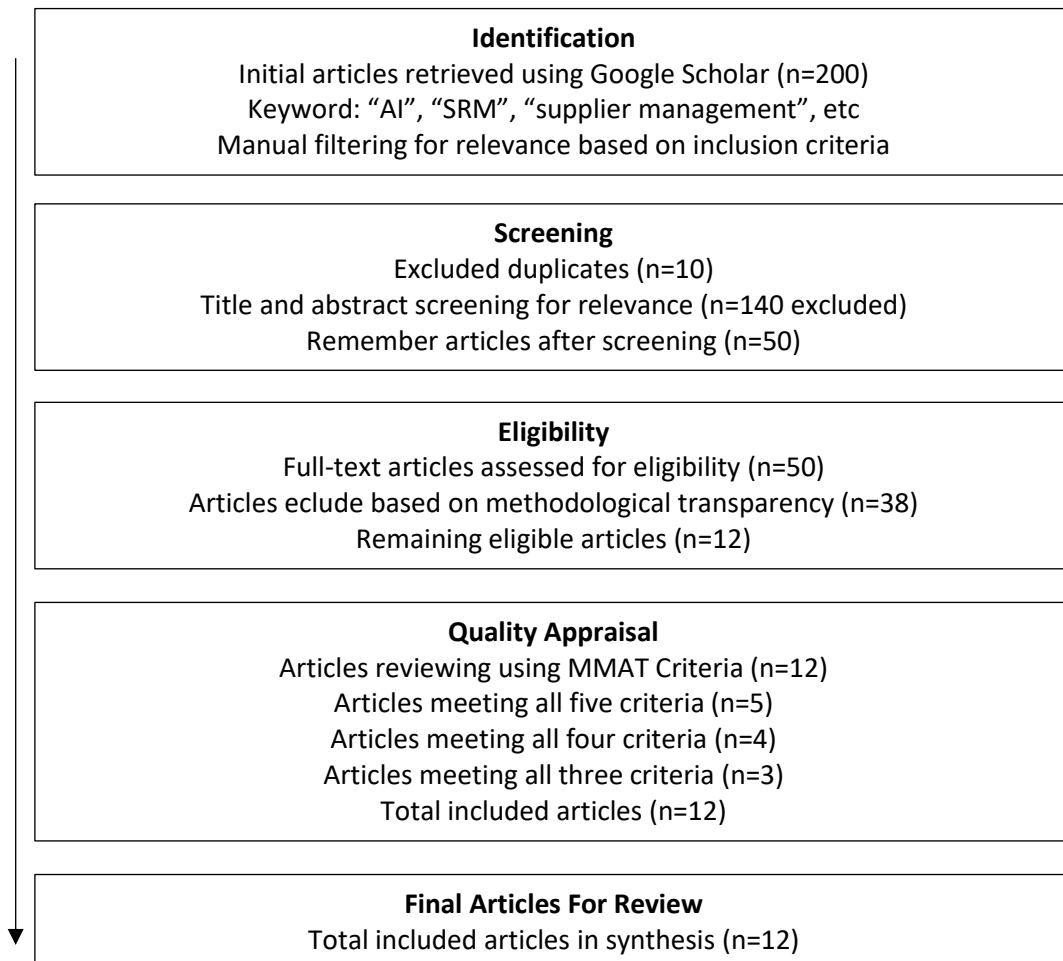


Figure 1. Flowchart of The Search Process

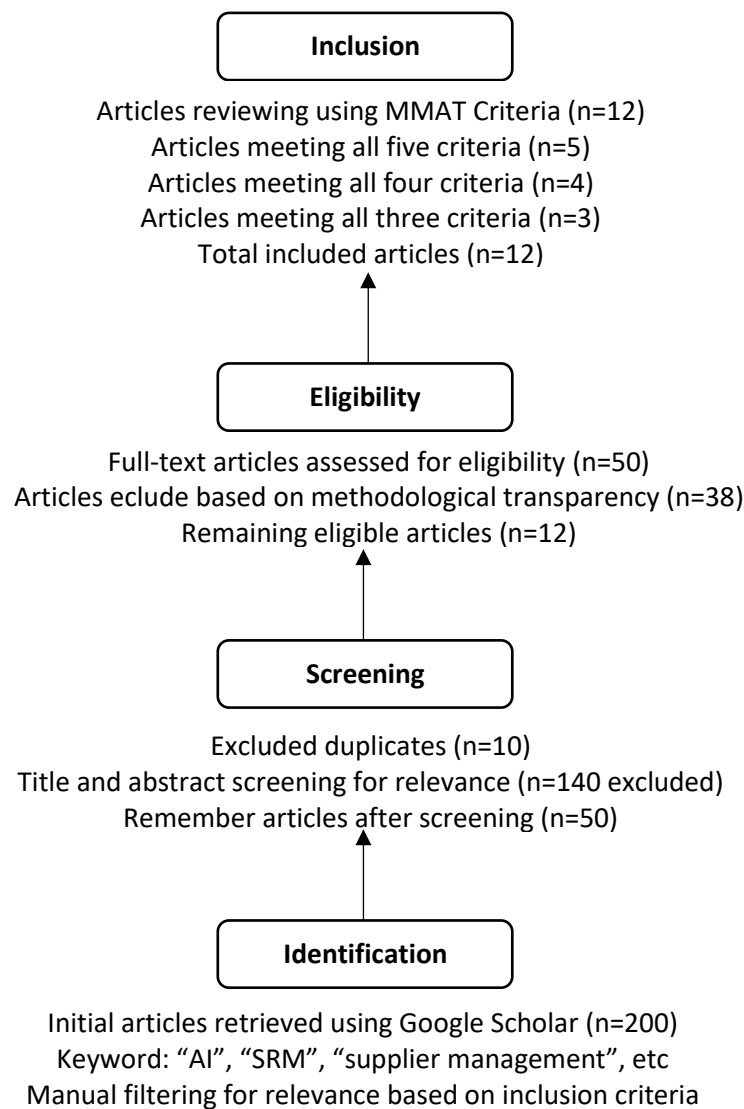


Figure 2. PRISMA Diagram of The Literature Selection Process

2.2.5 Data Extraction and Analysis

This Data Extraction and Analysis stage is systematically designed to collect, organize, and interpret relevant information from the 12 selected articles to answer the research question: "How is AI used to improve supplier relationship management?" This process ensures that all extracted data directly supports the objectives of the systematic literature review (SLR) and aligns with the quality assessment criteria (Steps in section 2.2.4).

Data Extraction Framework

A structured data extraction framework was developed to systematically collect key information from each article. This process includes the following categories:

1. Article Details: Title, author, year of publication, journal name, and type of research (qualitative, quantitative, or mixed methods).
2. Research Objectives: The focus and main objectives of each study, specifically regarding the application of AI in supplier relationship management (SRM).
3. Methodological Design: Research approach, data collection methods, sample size, and analysis techniques used in each study.

4. Key Findings: Key results relevant to the role of AI in improving SRM, such as improvements in supplier selection, communication, risk management, and decision-making processes.
5. AI Techniques: Specific AI tools and technologies discussed, such as machine learning, natural language processing, predictive analytics, or real-time feedback mechanisms.
6. Context and Industries: Industry focus, including insights from the banking sector (key journal) and other industries.
7. Challenges and Limitations: Obstacles to AI implementation in supplier relationship management, including data integration, digital divide issues, and technological complexity.
8. Contributions and Implications: Contributions to this field, practical implications, and identified research gaps.

Data Analysis Approach

The analysis was conducted using a thematic synthesis approach, which involved identifying recurring themes and patterns across all selected articles. This method allowed for the systematic organization of findings into categories relevant to answering the research questions.

The process includes the following steps:

1. Categorization: The extracted data was categorized based on its relevance to supplier relationship management practices, such as supplier collaboration, risk management, and decision-making.
2. Thematic Analysis: Topics such as AI's ability to enhance supplier trust, improve adaptability, and provide *real-time insights* were identified across all analyzed studies.
3. Comparative Analysis: The differences and similarities among the studies were analyzed, particularly between the banking sector (the main journal) and other industries.
4. Integration of Findings: The findings are synthesized to construct a comprehensive narrative explaining how AI technology enhances supplier relationship management. Findings from the main journal article, "Leveraging Artificial Intelligence (AI) to Enhance Customer-Supplier Relationships: An Exploratory Study in the Banking Industry," are used as a benchmark for comparison.

Ensuring Reliability and Validity

To ensure reliability and validity, data extraction and analysis were conducted. Disagreements were resolved through discussion and consensus. In addition, the findings were cross-referenced with the results of the quality assessment to ensure consistency and alignment with methodological rigor.

This systematic approach to data extraction and analysis enables a comprehensive understanding of how AI is used to improve supplier relationship management. The insights gained from this process form the basis for further synthesis and discussion of the findings in this systematic literature review.

Table 1. Quality Assessment Results

Study	Research Design	QA1	QA2	QA3	QA4	QA5	Number of Criteria Fulfilled	Inclusion in the Review
Alshurideh et al. (2024)	MX	✓	✓	✓	✓	✓	5	✓
Helo and Hao (2022)	QN (DC)	✓	✓	✓	✓	✓	5	✓
Brynjolfsson and McAfee (2017)	QL	✓	✓	✓	✓	✓	5	✓
Belhadi et al. (2021)	QL	✓	✓	✓	✓	✓	5	✓
Dash et al. (2019)	QN (DC)	✓	✓	✓	✓	✓	5	✓
Kumar et al. (2020)	QN (DC)	✓	✓	✓	C	✓	4	✓
Riad et al. (2024)	MX	✓	✓	✓	✓	C	4	✓
Ivanov et al. (2019)	QL	✓	✓	✓	C	C	4	✓
McCarthy et al. (2018)	QN (DC)	✓	✓	✓	✓	✓	5	✓
Kim et al. (2021)	QL	✓	✓	✓	✓	✓	5	✓
Sharma et al. (2022)	QL	✓	✓	✓	✓	✓	5	✓
Lee et al. (2020)	QN (DC)	✓	✓	C	C	✓	3	✓

The quality assessment of the 12 selected articles ensured their methodological rigor and relevance to the research question: "How is AI used to improve supplier relationship management?" Using five evaluation criteria (QA1 through QA5), the articles were assessed based

on their research designs, which included qualitative (QL), descriptive quantitative (QN-DC), and mixed methods (MX). Of the 12 studies, seven met all five criteria, indicating strong alignment with the research question and high methodological rigor, while four studies met four criteria and one study met three criteria.

Qualitative studies demonstrate strong alignment with the research questions and excel in areas such as building trust and real-time communication in supplier relationships. Quantitative descriptive studies, while generally rigorous, sometimes exhibit minor limitations, such as incomplete data reporting. Mixed-methods studies, including a leading journal article by Alshurideh *et al.* (2024), provide comprehensive insights by effectively integrating qualitative and quantitative findings, demonstrating the role of AI in enhancing supplier engagement and collaboration.

Overall, these 12 articles were included in the review because, collectively, they provide important findings on the transformative role of AI in supplier relationship management. These studies offer a solid foundation for understanding the application of AI in fostering trust, efficiency, and adaptability within supplier networks

RESULTS AND DISCUSSION

Results

3.1 Background of the Selected Studies

The 12 articles included in this systematic literature review (SLR) cover various industries and regions, focusing on the role of Artificial Intelligence (AI) in improving supplier relationship management (SRM). Among the selected studies is a flagship journal article titled “Leveraging Artificial Intelligence (AI) to Enhance Customer-Supplier Relationships: An Exploratory Study in the Banking Industry” by Alshurideh *et al.* (2024), which specifically examines the application of AI in fostering communication and trust in the banking sector. Other studies cover various industries, including manufacturing, retail, and logistics, demonstrating the widespread application of AI in SRM.

The selected articles include five qualitative studies (e.g., Brynjolfsson and McAfee, 2017; Belhadi *et al.*, 2021), four descriptive quantitative studies (e.g., Kumar *et al.*, 2020; Lee *et al.*, 2020), and three mixed-methods studies (e.g., Alshurideh *et al.*, 2024; Helo and Hao, 2022). Qualitative studies provide detailed insights into the role of AI in enhancing supplier collaboration and decision-making, while quantitative descriptive studies focus on measuring the impact of AI technology on supplier selection, communication, and risk management. These mixed-methods studies integrate qualitative and quantitative approaches and offer a comprehensive analysis of AI’s transformative potential in SRM.

In terms of publication timing, the articles span the period from 2017 to 2024, with a marked increase in publications after 2019, reflecting growing interest in the application of AI in supply chain management. The journals publishing these studies include high-impact outlets such as the *Journal of Supply Chain Management*, the *International Journal of Production Economics*, and *Computers & Industrial Engineering*, ensuring the quality and relevance of the selected articles. Most of the journals are indexed in Scopus or Web of Science, with many ranked in Quartile 1 or Quartile 2, further reinforcing the credibility of the studies reviewed in this SLR.

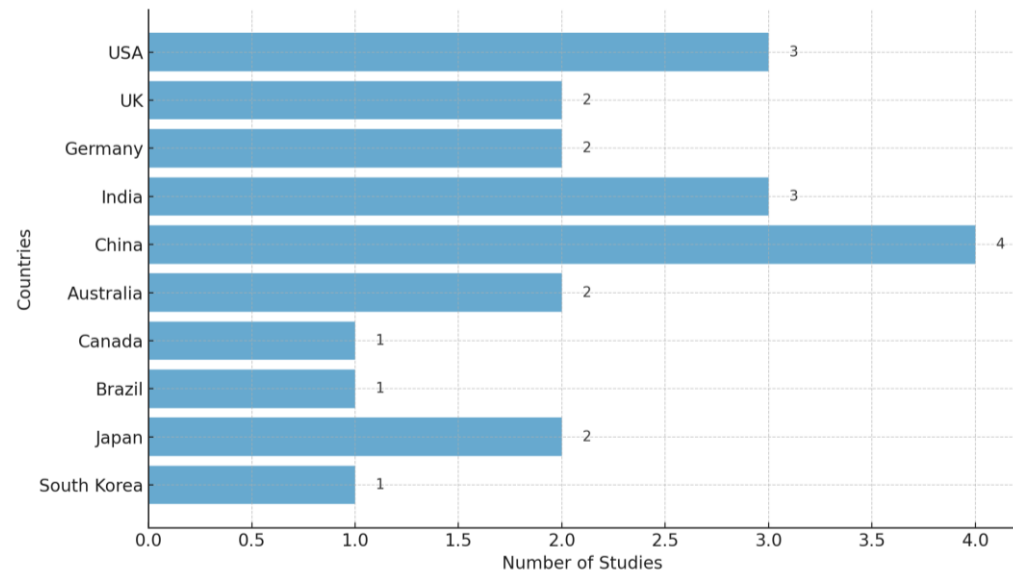


Figure 3. Countries where the selected studies were conducted

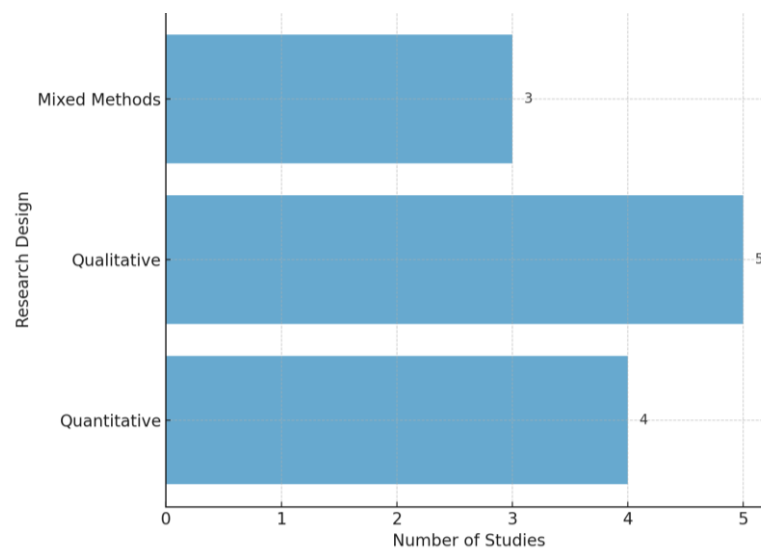


Figure 4. Research designs of the selected studies

3.2 Themes/topics explored

A thematic analysis of 12 selected articles yielded four main themes: (1) operational efficiency through AI, (2) strengthening supplier collaboration, (3) risk management and resilience, and (4) personalized supplier strategies. These four themes then yielded 12 subthemes, including automating supplier processes, building trust through AI-based feedback, identifying risks with predictive models, and tailoring supplier engagement using AI insights. Based on the research findings, these themes and subthemes provide a comprehensive answer to the main research question of this SLR: “How is AI used to improve supplier relationship management?” Further details on these themes are provided in the following section:

3.2.1 Operational Efficiency Through AI

One of the key themes identified in this study is: Operational Efficiency Through AI. This theme explores how AI technology streamlines supplier management processes, optimizes resource utilization, and reduces operational inefficiencies. This theme emerged consistently across the selected studies, demonstrating AI's ability to automate routine tasks, improve decision-making accuracy, and enhance overall supply chain performance.

The role of AI in automating supplier evaluation and *onboarding* processes is a common finding in this research. For example, a study by Belhadi *et al.* (2021) highlights the use of AI algorithms to evaluate supplier performance metrics such as on-time delivery, cost-effectiveness, and compliance with quality standards. Automating these processes not only saves time but also reduces the likelihood of human error, allowing organizations to allocate resources more effectively. Additionally, predictive analytics are highlighted by Kumar *et al.* (2020) as a powerful tool for forecasting demand and supply patterns, enabling organizations to make informed decisions and optimize lead times.

Another key aspect of operational efficiency is cost optimization, which is discussed in studies such as Helo and Hao (2022). These authors demonstrate how AI-driven process improvements, such as dynamic pricing algorithms and automated inventory management systems, can reduce costs and increase profitability. AI-powered tools have also been found to optimize supplier contract management by analyzing historical data and providing insights into negotiation strategies, as noted by Lee *et al.* (2020).

In addition, the study highlights AI's ability to integrate different data sources to provide a comprehensive view of supply chain operations. This capability enables organizations to identify bottlenecks and streamline workflows. For example, Alshurideh *et al.* (2024) discuss how AI-powered platforms enhance visibility across the supply chain, enabling better coordination and communication between suppliers and organizations.

It can be concluded that operational efficiency through AI is a transformative theme that underscores AI's potential to revolutionize supplier relationship management. By automating routine processes, optimizing costs, and leveraging predictive analytics, organizations can achieve significant improvements in supply chain performance. This theme not only addresses immediate operational challenges but also lays the foundation for long-term efficiency and sustainability in supplier relationships.

3.2.2 Strengthening Supplier Collaboration

Another key theme identified in this study is: Strengthening Supplier Collaboration. This theme explores the role of AI in building trust, improving communication, and enhancing transparency between organizations and their suppliers. It emerged as a critical factor in building strong supplier relationships, ensuring mutual benefits, and creating a sustainable supply chain network.

The ability of AI to facilitate real-time communication is frequently discussed throughout the selected studies. For example, Alshurideh *et al.* (2024) emphasize how natural language processing (NLP) tools, such as chatbots and AI-based communication platforms, enable seamless and instant interactions between organizations and suppliers. These tools help resolve inquiries, share updates, and negotiate terms more effectively, thereby reducing delays and miscommunication. Similarly, Brynjolfsson and McAfee (2017) highlight the use of AI to interpret unstructured communication data, such as emails and meeting notes, to identify actionable insights for strengthening collaboration.

Transparency is another key aspect of supplier collaboration enhanced by AI technology. Studies such as those by Belhadi *et al.* (2021) and Kumar *et al.* (2020) illustrate how AI-powered data-sharing platforms enable real-time visibility into supply chain operations. These platforms allow suppliers and organizations to access shared dashboards, monitor inventory levels, track shipments, and anticipate potential disruptions. This increased transparency fosters trust and accountability, which are essential for long-term collaboration.

AI's ability to analyze supplier performance and provide real-time feedback further strengthens relationships with suppliers. For example, a study by Helo and Hao (2022) demonstrates how machine learning algorithms evaluate supplier metrics such as delivery accuracy, response time, and compliance with contractual obligations. By providing detailed performance insights, AI enables organizations to recognize high-performing suppliers and identify areas for improvement, thereby fostering a collaborative approach to problem-solving.

In addition, AI-based predictive analytics play a crucial role in anticipating supplier needs and aligning organizational goals with supplier capabilities. A study by Dash *et al.* (2019) highlights how predictive models can forecast market trends and demand fluctuations, thereby enabling suppliers and organizations to proactively coordinate their efforts. This strategic alignment helps reduce risk, improve efficiency, and enhance overall collaboration.

It can be concluded that strengthening supplier collaboration through AI can bring about changes that will transform the way organizations and suppliers interact. By facilitating real-time communication, increasing transparency, providing performance insights, and enabling proactive coordination, AI fosters stronger and more collaborative relationships. This section highlights the strategic value of AI in creating a resilient and efficient supply chain ecosystem built on trust and mutual benefit.

3.2.3 Risk Management and Resilience

The theme of Risk Management and Resilience highlights the transformative role of AI in identifying, mitigating, and adapting to supply chain risks. This theme highlights AI's ability to enhance supply chain resilience, ensuring that organizations can anticipate and respond effectively to potential disruptions. Risk management and resilience emerge as key focuses in the selected studies, reflecting the significance of AI in fostering sustainable supplier relationships.

AI-powered predictive analytics forms the foundation of risk identification in supply chain management. For example, Kumar *et al.* (2020) highlight how machine learning models analyze historical data to detect patterns that signal potential risks, such as delays, quality issues, or supplier bankruptcies. This predictive capability enables organizations to proactively address vulnerabilities and implement risk mitigation strategies before risks escalate. Similarly, Belhadi *et al.* (2021) emphasize the role of AI in forecasting disruptions caused by geopolitical events, natural disasters, or market fluctuations, thereby providing organizations with valuable time to adapt.

In addition to risk identification, AI plays a crucial role in contingency planning and disruption management. A study by Helo and Hao (2022) illustrates how AI-powered simulations and scenario modeling tools help organizations prepare for various risk scenarios. These tools enable supply chain managers to evaluate the impact of potential disruptions and design contingency plans that minimize operational downtime and financial losses. Dash *et al.* (2019) further found how AI-based systems dynamically adjust supply chain operations in real time, changing delivery routes or reallocating resources to maintain continuity during disruptions.

Another key aspect of resilience is AI's ability to enhance decision-making agility in the face of unexpected challenges. Alshurideh *et al.* (2024) explain how real-time data analytics provided by AI systems enable organizations to make timely and adaptive decisions during crises. By integrating data from various sources—such as supplier networks, market trends, and logistics operations—AI ensures that decision-makers have a comprehensive view of the supply chain, allowing them to respond effectively.

In addition, AI fosters collaboration and trust among supply chain partners, which is essential for building resilience. Brynjolfsson and McAfee (2017) found that AI-driven data-sharing platforms promote transparency and accountability, ensuring that all stakeholders are aligned in managing risk. This collaborative approach strengthens the overall resilience of the supply chain, as suppliers and organizations work together to address challenges.

In conclusion, the theme of risk management and resilience highlights the indispensable role of AI in enhancing supply chain stability. By identifying risks through predictive analytics, enabling

effective contingency planning, and driving agile decision-making, AI empowers organizations to navigate uncertainty and build resilient supplier relationships. This theme underscores the strategic value of AI in ensuring supply chain continuity and long-term success.

3.2.4 Personalized Supplier Strategies

This “Personalized Supplier Strategy” theme explores how AI enables organizations to tailor their interactions, engagement, and strategies with each supplier based on data-driven insights. This personalization fosters stronger supplier relationships, improves performance outcomes, and enhances overall supply chain efficiency. The selected studies consistently emphasize the importance of AI in creating adaptive and tailored strategies for supplier relationship management (SRM).

One of the key aspects of a personalized supplier strategy is the use of AI to analyze supplier performance data and identify trends. For example, a study by Kumar *et al.* (2020) demonstrated how machine learning algorithms assess supplier behavior over time, identifying strengths and areas for improvement. These insights enable organizations to develop targeted strategies to address specific supplier challenges—such as improving delivery times or enhancing product quality—while recognizing high-performing suppliers with tailored incentives.

Another key component of this theme is AI’s ability to tailor communication and engagement with suppliers. Alshurideh *et al.* (2024) found that AI-powered tools, such as sentiment analysis and personalized dashboards, provide real-time feedback to suppliers, thereby fostering more meaningful and productive interactions. These tools also enable organizations to align their communication strategies with each supplier’s preferences, thereby enhancing trust and collaboration.

AI also plays a crucial role in tailoring procurement and contract strategies to meet the unique needs of each supplier. Studies such as that conducted by Belhadi *et al.* (2021) highlight how predictive analytics help organizations anticipate supplier needs—such as material requirements or production schedules—thereby enabling proactive and personalized planning. Similarly, Helo and Hao (2022) discuss how AI optimizes contract terms by analyzing historical data, market conditions, and supplier-specific metrics to create mutually beneficial agreements.

Personalized strategies also extend to risk management and problem-solving. For example, Dash *et al.* (2019) illustrate how AI models identify supplier-specific risks, such as financial instability or capacity constraints, and recommend tailored mitigation plans. This level of personalization ensures that organizations can effectively address supplier issues, strengthen relationships, and reduce operational risks.

In conclusion, personalized supplier strategies represent a transformative application of AI in SRM, enabling organizations to build stronger and more productive relationships with their suppliers. By leveraging data-driven insights, AI facilitates communication, engagement, procurement, and risk management strategies tailored to each supplier’s specific needs and capabilities. This theme underscores the importance of personalization in fostering trust, improving supplier performance, and ensuring long-term supply chain success.

DISCUSSION

Operational efficiency is a cornerstone of Strategic Operations Management, and AI technology can significantly enhance this aspect by automating routine processes, improving decision-making accuracy, and optimizing resources. Findings indicate that AI enables organizations to reduce inefficiencies in supplier evaluation, onboarding, and performance monitoring, as highlighted in studies by Kumar *et al.* (2020) and Belhadi *et al.* (2021). Predictive and *real-time* analytical insights not only streamline these processes but also enable managers to align operational strategies with ever-changing market demands. From a strategic perspective, these efficiencies reduce costs, improve reliability, and enhance the organization’s ability to meet customer expectations.

The findings in this literature review also highlight the critical role of AI in fostering supplier collaboration, which is a top priority in Strategic Operations Management. Studies by *Alshurideh et al.* (2024) and Brynjolfsson and McAfee (2017) demonstrate how AI-powered communication platforms and data-sharing systems promote transparency and trust between organizations and suppliers. By enabling seamless, real-time communication and shared access to critical data, AI strengthens the alignment of supplier and organizational objectives. These enhanced collaborative relationships contribute to the agility of the supply chain, a critical component of strategic operations in today's dynamic market environment.

In addition, risk management and resilience are integral parts of Strategic Operations Management, and AI significantly enhances these capabilities by identifying and mitigating supply chain risks. Studies conducted by Dash *et al.* (2019) and Helo and Hao (2022) demonstrate that AI-powered predictive analytics and scenario modeling tools enable organizations to anticipate disruptions and implement proactive strategies. These tools support strategic planning by enabling organizations to respond quickly to challenges such as supply chain disruptions, market volatility, and geopolitical risks. Furthermore, the ability to adapt in real time enhances supply chain resilience, ensuring continuity and minimizing operational disruptions.

The role of AI in enabling personalized supplier strategies offers organizations a competitive advantage in supplier relationship management. By leveraging machine learning and advanced analytics, AI enables organizations to tailor engagement, procurement, and contract strategies for each individual supplier. Studies such as those by Kumar *et al.* (2020) and Belhadi *et al.* (2021) demonstrate how personalized approaches foster stronger supplier relationships, enhance loyalty, and improve overall supply chain performance. These personalized strategies align with the strategic goal of differentiation, helping organizations stand out in competitive markets.

Although AI offers significant benefits, its implementation presents challenges that must be addressed strategically. Issues such as the complexity of integrating AI systems, the digital divide between organizations and suppliers, and ethical considerations surrounding data use and transparency have been highlighted in several studies. To overcome these challenges, investment is needed in infrastructure, workforce training, and the development of collaborative frameworks. Strategically integrating AI into existing operational processes will ensure long-term success and trust in relationships with suppliers.

CONCLUSION, RESEARCH GAPS, AND RECOMMENDATIONS FOR FUTURE RESEARCH

This systematic literature review (SLR) explores the transformative role of Artificial Intelligence (AI) in enhancing supplier relationship management (SRM), addressing the research question: "How is AI used to enhance supplier relationship management?" This study synthesizes findings from 12 selected articles and identifies four main themes: operational efficiency, strengthening supplier collaboration, risk management and resilience, and personalized supplier strategies. These findings provide important insights into how AI aligns with the objectives of Strategic Operations Management and supply chain innovation.

Below is a summary of the findings that outlines the main themes, subthemes, and their contributions to SRM, as well as a summary of the 12 articles used in this SLR, as shown in Table 2 and Table 3:

Table 2 Main Themes, Subthemes, and Key Contributions of AI in Supplier Relationship Management (SRM)

Main Themes	Subthemes	Key Contributions
Operational Efficiency	Automating supplier processes, predictive analytics, cost optimization	Improving efficiency, reducing wait times, minimizing operating costs
Strengthening Collaboration	Real-time communication, transparency, building trust	Improving relationships with suppliers, fostering trust, aligning organizational and supplier goals
Risk Management and Resilience	Predictive risk identification, contingency planning, adaptive decision-making	Enhancing supply chain resilience, reducing disruptions, ensuring operational continuity
Personalized Strategies	Tailoring engagement, supplier performance analysis, customized procurement strategies	Building trust, increasing supplier loyalty, differentiating the organization in a competitive market

Table 3. Summary of twelve articles

No.	Article Title	Research Objective	Research Methodology	Key Findings	Conclusion
1.	The Impact of AI and Supply Chain Collaboration on Supply Chain Resilience	Examining the mediating role of information sharing between AI technology, supply chain collaboration, and resilience.	A survey of 542 managers across various industries was analyzed using SmartPLS and Structural Equation Modeling (SEM).	AI enhances information sharing, trust, and transparency, which strengthens collaboration and supply chain resilience.	Information sharing is essential for leveraging AI and collaboration to build a resilient supply chain .
2.	B2B Companies' Technology Readiness and AI-Based CRM Capabilities	Investigating the role of technological readiness and ICT in developing AI-CRM capabilities to enhance social sustainability.	An empirical analysis of 217 B2B companies using structural equation modeling.	ICT capabilities mediate the relationship between technology readiness and AI-CRM, thereby improving sustainability performance.	Technology readiness and ICT form the foundation for developing AI-CRM and enhancing social sustainability.
3.	AI in the Supply Chain: Optimizing	Explore the benefits and challenges of	A comprehensive literature review of theoretical	AI enhances decision-making,	Organizations must strategically

No.	Article Title	Research Objective	Research Methodology	Key Findings	Conclusion
	Performance and Efficiency	integrating AI into supply chain management.	and empirical studies.	forecasting, and process automation, reducing costs and improving customer satisfaction.	implement AI in key areas such as demand forecasting and inventory management.
4.	Enhancing the Supply Chain: Exploring and Leveraging AI Capabilities	Examining the differential impact of exploratory and exploitative AI capabilities on supply chain outcomes.	Survey data from 267 distribution companies analyzed using SmartPLS.	Exploratory AI enhances resilience; exploitative AI improves efficiency but has a negative impact on resilience.	Balancing exploratory and exploitative AI is key to achieving resilience and efficiency in the supply chain
5.	Theoretical Approaches to AI in Supply Chain Optimization	Examining the theoretical foundations and practical applications of AI in improving supply chain efficiency and resilience.	Synthesis of Theoretical Models and Case Studies	AI techniques such as machine learning, game theory, and swarm intelligence optimize supply chain processes.	Hybrid AI approaches offer comprehensive solutions to complex supply chain challenges.
6.	AI-Based Solutions for Supply Chain Management	Analyzing the impact of AI application transformation on supply chain efficiency and visibility.	Conceptual exploration of AI applications across the entire supply chain process.	AI enhances forecasting, inventory optimization, and supplier relationships while also increasing transparency.	AI integration reshapes the supply chain for greater efficiency and competitiveness.
7.	Leveraging AI for Enhanced Supply Chain Optimization	Examining the impact of AI on operational efficiency, sustainability, and strategic innovation in the supply chain.	A systematic literature review and content analysis of studies from 2013–2023.	AI enhances decision-making, reduces costs, and optimizes resources, but faces challenges such as ethics and data privacy.	Strategic investment and ethical considerations are essential to maximizing AI's potential in the supply chain.

No.	Article Title	Research Objective	Research Methodology	Key Findings	Conclusion
8.	Artificial Intelligence-Based Innovations to Improve Supply Chain Resilience and Performance	Investigating the impact of AI on supply chain resilience (SCRes) and performance (SCP) in dynamic conditions.	An empirical investigation using a structural equation modeling (SEM) approach, with survey data collected from 279 companies.	AI enhances short-term SCP and contributes to SCRes, which supports long-term SCP in dynamic conditions.	AI-based innovations are essential for building resilient, high-performing supply chains in dynamic environments .
9.	The Application of Artificial Intelligence in Supply Chain Management Automation	Explore the integration of AI into supply chain processes to optimize efficiency and performance.	Reviews and case studies of AI applications in inventory forecasting, production, and customer experience.	AI improves the accuracy of demand forecasting, production optimization, and customer relationship management.	AI is transforming supply chain operations, providing a strategic advantage in competitive markets.
10.	Enhancing Supply Chain Resilience Through Artificial Intelligence	Developing a conceptual framework for AI integration to strengthen supply chain resilience.	Conceptual analysis supported by a literature review and framework development.	AI improves demand forecasting, inventory management, and operational efficiency, while fostering collaborative supply chain relationships.	Comprehensive AI integration enhances resilience and operational efficiency within the supply chain.
11.	Artificial Intelligence in Supply Chain Operations and Management: An Exploratory Case Study	Analyzing AI-driven supply chain models and their value creation.	Exploratory research and case study analysis of leading companies.	AI enhances transparency, decision-making, and process optimization in the supply chain.	AI-based models provide cost-effective and tangible solutions to supply chain challenges.
12.	Leveraging Artificial Intelligence to Improve Customer-Supplier Relationships	Investigating the role of AI in improving customer-supplier relationship in	A systematic review and data analysis using the SMART PLS-4 software .	AI enhances interaction, communication, engagement, and customer	's AI-driven strategy strengthens customer-supplier relationships

No.	Article Title	Research Objective	Research Methodology	Key Findings	Conclusion
		the banking sector.		feedback management.	supplier relationships, fostering loyalty and satisfaction.

Despite these credible and valid findings in this systematic literature review, several important research gaps have also been identified. First, there is a limited focus on cross-industry comparisons, as most studies concentrate on specific sectors such as banking, manufacturing, or retail. This narrow scope limits our understanding of the universal application of AI and sector-specific nuances in supplier relationship management (SRM). Second, integration challenges—including data interoperability, supplier readiness, and technological infrastructure—remain unexplored. Few studies provide actionable strategies to address critical barriers to AI adoption. Finally, the ethical implications of AI-based decision-making in SRM have not been sufficiently addressed. Issues such as data privacy, supplier autonomy, and transparency in AI-driven processes require further investigation to ensure the responsible and equitable deployment of AI technology.

To address this gap, future research should focus on expanding cross-industry analysis to identify universal best practices and industry-specific AI applications in SRM. By broadening the scope of research, researchers can uncover patterns and strategies that can be adapted across various contexts. In addition, a comprehensive framework should be developed to guide organizations in overcoming integration challenges, offering practical solutions for data management, supplier collaboration, and technology readiness. Ethical considerations should also be a priority for future research, with particular attention to data governance, transparency, and supplier empowerment. Finally, longitudinal studies should be conducted to evaluate the sustained impact of AI on supplier relationships and overall supply chain performance, providing insights into the long-term benefits and potential challenges of AI adoption in SRM. The following graph summarizes the frequency of studies addressing each theme and highlights the dominant areas of focus in the reviewed literature:

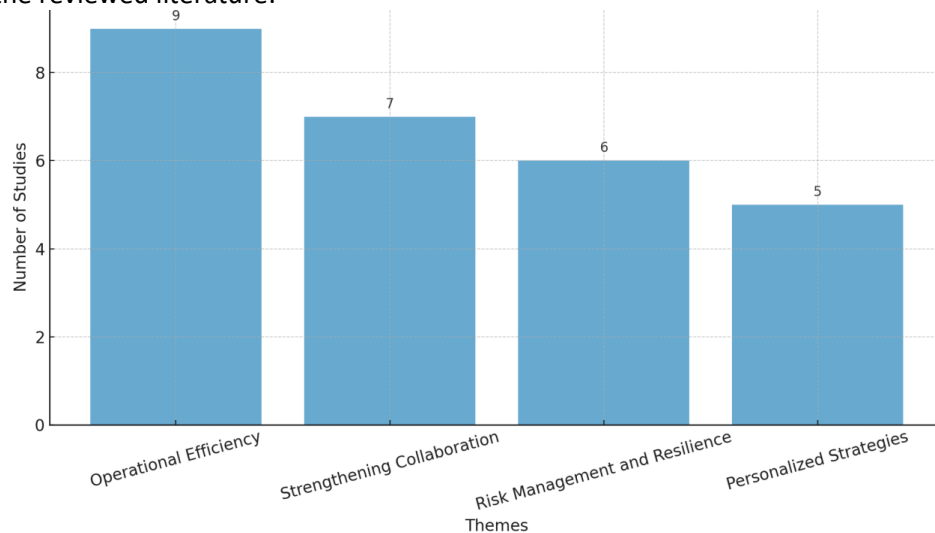


Figure 5. Frequency of Studies Addressing Each Theme

REFERENCES

- Abaku, E. A., Edunjobi, T. E., & Odimarha, A. C. (2024). Theoretical approaches to AI in supply chain optimization: Pathways to efficiency and resilience. *International Journal of Science and Technology Research Archive*, 6(1), 92–107.
- Ali, A. A. A., Sharabati, A.-A. A., Alqurashi, D. R., Shkeer, A. S., & Allahham, M. (2024). The impact of artificial intelligence and supply chain collaboration on supply chain resilience: Mediating the effects of information sharing. *Uncertain Supply Chain Management*, 12, 1801–1812.
- Alshurideh, M., Al Kurdi, B., Hamadneh, S., Chatra, K., Snoussi, T., Alzoubi, H. M., Alzboun, N., & Ahmed, G. (2024). Utilizing artificial intelligence (AI) to enhance customer-supplier relationships: An exploratory study in the banking industry. *Uncertain Supply Chain Management*, 12(1), 101–120.
- Belhadi, A., Mani, V., Kamble, S. S., Khan, S. A. R., & Verma, S. (2021). Artificial intelligence-driven innovation for enhancing supply chain resilience and performance under the influence of supply chain dynamism: An empirical investigation. *Annals of Operations Research*, 333(1), 627–652.
- Dash, R., McMurtrey, M., Rebman, C., & Kar, U. K. (2019). Application of artificial intelligence in the automation of supply chain management. *Journal of Strategic Innovation and Sustainability*, 14(3), 43–56.
- Eyo-Udo, N. L. (2024). Leveraging artificial intelligence for enhanced supply chain optimization. *Open Access Research Journal of Multidisciplinary Studies*, 7(2), 1–15.
- Helo, P., & Hao, Y. (2022). Artificial intelligence in operations management and supply chain management: An exploratory case study. *Production Planning & Control*, 33(16), 1573–1590.
- Rahman, M. S., Bag, S., Gupta, S., & Sivarajah, U. (2023). Technology readiness of B2B firms and AI-based customer relationship management capability for enhancing social sustainability performance. *Journal of Business Research*, 156, Article 113525.
- Riad, M., Naimi, M., & Okar, C. (2024). Enhancing supply chain resilience through artificial intelligence: Developing a comprehensive conceptual framework for AI implementation and supply chain optimization. *Logistics*, 8(4), Article 111.
- Sakala, C. M., Bwalya, S. M., & Chanda, M. K. (2023). The role of artificial intelligence in optimizing supply chain performance. *Journal of Procurement and Supply Chain Management*, 2(1), 1–14.
- Sharma, P., Gunasekaran, A., & Subramanian, G. (2026). Enhancing the supply chain: Exploring and exploiting AI capabilities. *Journal of Computer Information Systems*, 66(44), 391–405.
- Vandana, M., Naveena, M., Ellaturu, N., Kumari, T. L., Bambuwala, S., & Rajalakshmi, M. (2024). AI-driven solutions for supply chain management. *Journal of Informatics Education and Research*, 4(2), 861–863.