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ARTIFICIAL INTELLIGENCE IN FINANCIAL DECISION-MAKING AND COMPETITIVE ADVANTAGE: EVIDENCE FROM SELECTED EUROPEAN INDUSTRIAL FIRMS

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Abstract: *This paper analyzes the role of artificial intelligence (AI) in improving financial decision-making and creating competitive advantage in selected European industrial companies. The aim of the study is to assess how integrating AI into financial planning, risk management, performance analysis, operational processes, and strategic decision-making affects firms' efficiency, resilience, and competitive positioning. The study employs a qualitative multiple-case study approach using secondary data, including annual reports, sustainability reports, investor materials, and official corporate documents from three European industrial companies: Siemens AG, Schneider Electric SE, and Krka. d., Novo mesto. The findings show that AI contributes to more accurate financial forecasting, cost optimization, data-driven risk management, operational efficiency, and improved strategic decision support. Siemens AG and Schneider Electric SE demonstrate a stronger AI-driven competitiveness model in which AI is closely linked to digital platforms, automation, industrial innovation, and sustainability-oriented value creation. In contrast, Krka reflects a more gradual digital transformation path, in which competitiveness is primarily supported by financial discipline, operational efficiency, risk control, and ESG governance. The study contributes to the literature by demonstrating that AI enhances competitive advantage when combined with financial management, organizational capabilities, digital maturity, and responsible governance among European industrial firms.*

Keywords: *Artificial intelligence, financial decision-making, competitive advantage, digital transformation, business performance.*

1. Introduction

Artificial intelligence (AI) has become an important driver of digital transformation, strategic decision-making, and competitive advantage in contemporary enterprises. In an increasingly complex business environment, firms are required to process large volumes of data, respond quickly to market changes, control costs, manage risks, and improve the quality of financial and strategic decisions. In this context, AI is no longer viewed only as a technological tool for automation, but also as a strategic capability that supports data-driven decision-making, financial forecasting, performance monitoring, and organizational resilience.

The relevance of AI is particularly important for European industrial firms, which operate under strong competitive pressure, technological change, energy transition, supply chain uncertainty, and growing sustainability requirements. Industrial companies are characterized by complex production systems, large capital investments, extensive supply chains, and continuous pressure to improve operational efficiency. Therefore, integrating AI into financial planning, risk management, cost optimization, performance analysis, and

strategic decision-making can strengthen both financial performance and long-term competitiveness.

From a theoretical perspective, AI creates value when it is developed as an organizational capability and integrated into managerial routines, data governance, and strategic decision-making processes. Mikalef and Gupta (2021) argue that AI capability can improve organizational creativity and firm performance, suggesting that the value of AI depends not only on technological adoption but also on the firm's ability to combine data, skills, infrastructure, and managerial processes. Similarly, Mikalef et al. (2023) show that AI competencies can strengthen organizational performance by developing business capabilities, supporting the view that AI should be treated as a strategic resource. In manufacturing organizations, Dubey et al. (2020) demonstrate that big data analytics and AI contribute to operational performance, particularly amid environmental dynamism. These findings are directly relevant to European industrial firms, where financial decision-making, operational efficiency, risk management, and competitive advantage depend on the effective integration of digital and analytical capabilities.

Recent studies also emphasize the importance of digital transformation and AI for firms' resilience, competitiveness, and strategic development. Ağtaş (2025) highlights the dual role of AI in corporate processes, showing that AI can improve data-driven decision support, monitoring, and crisis response, while also creating challenges related to transparency, ethics, accountability, and data protection. Similarly, Sorokina and Lebedeva (2025) show that digital transformation enhances enterprise resilience by improving adaptability, efficiency, and responsiveness to external shocks. At the European level, Tanik (2025) demonstrates that digital transformation efficiency is closely connected with technological readiness, innovation capacity, and competitive advantage across EU countries. These studies provide a relevant academic foundation for examining how AI and digital transformation affect decision-making and competitiveness in European industrial firms.

Although the existing literature has widely discussed AI in relation to innovation, digital transformation, business performance, and organizational strategy, less attention has been paid to how AI supports financial decision-making in established European industrial companies. Many studies focus on technology firms, digital services, banking, or start-ups, while industrial enterprises remain underexplored, despite their importance to European competitiveness and sustainable economic development. This creates a relevant research gap, particularly in understanding how AI is linked to financial planning, risk management, operational efficiency, governance, and competitive positioning. Therefore, the aim of this paper is to analyze the role of artificial intelligence in improving financial decision-making and creating competitive advantage in selected European industrial firms. The study focuses on Siemens AG, Schneider Electric SE, and Krka. d., Novo mesto, as three relevant European industrial cases with different levels of digital maturity and strategic orientation. By comparing these firms, the paper seeks to explain how AI and digital transformation contribute to financial decision-making, operational efficiency, risk control, and long-term competitiveness.

The contribution of this study is threefold. First, it contributes to the literature on AI and financial decision-making by analyzing the topic in the context of European industrial firms. Second, it provides a comparative perspective on different pathways to competitive advantage, distinguishing between AI-driven competitiveness and financial-operational resilience. Third, it offers practical insights for managers, financial decision-makers, and policymakers on how AI can support strategic decisions, improve efficiency, and strengthen business resilience in a dynamic European industrial environment.

2. Literature Review

The literature increasingly treats artificial intelligence (AI) as a strategic capability that changes how firms create value, organize business models, and build competitive advantage. AI-driven business model innovation is no longer limited to technological adoption; it also involves how firms redesign value creation, value delivery, and value capture. This perspective is particularly relevant for industrial enterprises, where financial decisions are closely linked to capital investments, cost structures, operational efficiency, and responsiveness to market changes. Existing studies suggest that AI creates value when it is embedded in core business processes and combined with technological, operational, and strategic capabilities rather than implemented as an isolated digital tool (Climent et al., 2024; Jorzik et al., 2024; Zhang et al., 2023; Sullivan & Fosso Wamba, 2024).

A central stream of research examines the role of AI in organizational decision-making. AI-based decision support systems allow managers to process complex data, identify patterns, and improve analytical capacity in uncertain business environments. Empirical studies indicate that AI-supported decision-making is positively associated with firm performance, particularly when firms also possess big data capabilities and internal AI capabilities. However, this literature also emphasizes that automated decision-making raises important concerns related to transparency, fairness, accountability, and algorithmic governance. Therefore, the role of AI in financial decision-making should be understood as a combination of analytical efficiency and responsible managerial control (Baytar, 2026; Giachino et al., 2024; Ossa-Cardona, 2024).

Another important group of studies links AI to firm performance, productivity, and competitive capabilities. Evidence suggests that firms with a stronger strategic focus on AI can improve profitability, operational efficiency, decision quality, innovation, and risk mitigation. At the same time, these effects are not automatic. The benefits of AI depend on the extent to which firms develop adequate skills, data governance mechanisms, and human–AI collaboration. This is especially important for financial and managerial decision-making, where AI must support, rather than replace, strategic judgment and organizational learning (Yao et al., 2025; Mishra et al., 2022; Al-Mamary, 2025; Okafor & Murphy, 2025).

The theoretical debate on AI and competitive advantage is closely related to the resource-based view and the capability perspective. From this standpoint, AI can become a source of competitive advantage when combined with organizational resources, managerial capabilities, an innovation culture, and adaptation to environmental dynamism. However, investments in AI do not necessarily yield superior performance if firms fail to translate business problems into AI-compatible solutions or to link AI initiatives to strategic objectives. For this reason, the analysis of industrial firms should focus not only on whether AI is present, but also on how it supports financial decisions, resource allocation, operational priorities, and competitive positioning (Krakowski et al., 2023; Gudigantala et al., 2023; Chen et al., 2022).

The literature on innovation and digital transformation further shows that AI can strengthen innovation performance by generating new knowledge, identifying hidden patterns in data, and accelerating strategic development processes. Studies in high-tech and business operations contexts indicate that AI can support radical innovation, operational sustainability, and more efficient business processes. Nevertheless, the impact of AI is conditioned by organizational factors, including resistance to external knowledge, data capabilities, and the alignment between digital transformation and business strategy. This supports the argument that AI in European industrial firms should be analyzed as part of a broader digital transformation system rather than as a stand-alone technological instrument (Guan et al., 2025; Hamedani et al., 2025; Zhang et al., 2025; Kitsios & Kamariotou, 2021).

A related strand of research examines AI, business value, and technology investment management. Studies show that the business value of AI depends on resource orchestration,

IT-business alignment, data governance, and managers' ability to evaluate AI investments under uncertainty. In this context, AI and Industry 4.0 technologies can contribute to cost reduction, productivity improvement, better team performance, and real-time information processing. These findings are directly relevant to financial decision-making in industrial firms, where managers must evaluate investments, control costs, forecast performance, and manage operational and financial risks (Perifanis & Kitsios, 2023; Queiroz et al., 2024; Martínez et al., 2024; BaniHani et al., 2024).

In the fields of competition, finance, and productivity, AI is associated with improved strategic differentiation, more accurate reporting, better data quality, and real-time performance insights. Research on corporate transparency and financial performance suggests that AI can improve reporting processes and support more timely managerial decisions. At the macro-organizational level, studies on generative AI and intangible assets show that productivity gains from AI may be underestimated because AI-related value depends on software, hardware, data infrastructure, databases, and organizational capital. This implies that the financial benefits of AI should be assessed within a wider framework of digital capital, organizational capability, and financial efficiency (Rosa et al., 2022; Almasarwah et al., 2024; Brynjolfsson et al., 2025; Corrado et al., 2021).

Recent studies on AI implementation also highlight the importance of functional and cross-functional integration. AI is increasingly used across finance, marketing, human resources, logistics, and operations, but its impact depends on governance structures, socio-technical adaptation, and organizational readiness. At the same time, research on AI and entrepreneurship indicates that the field remains fragmented and often focuses more on technological adoption than on judgment, cognition, and decision-making processes. This suggests that future research should move beyond asking whether AI is used and instead examine how AI changes the quality of decisions, the interpretation of data, and the sources of competitive advantage (Aguado-García et al., 2026; Retamal-Saavedra et al., 2026).

In the regional and financial context, previous studies provide a useful basis for connecting AI, digitalization, financial performance, and market outcomes. Research on AI in stock markets indicates that how firms integrate and communicate AI may influence expectations about price volatility, liquidity, and investment returns. Studies on digital performance in growing businesses show that digitalization is important for business development in transition economies and may serve as a foundation for more advanced AI adoption. In banking and finance, the integration of ESG, AI, and financial strategies has been linked to performance, transparency, sustainability, and risk management. Other studies on enterprises and pension funds emphasize the importance of indicators such as ROE, profit margin, asset utilization, returns, and portfolio performance in assessing financial efficiency. Although these studies do not always examine AI directly, they provide an important conceptual basis for the financial dimension of the present study (Morina, 2025; Shehu et al., 2022; Morina & Dinaj, 2025; Shabani et al., 2021; Mazreku et al., 2020).

Overall, the reviewed literature suggests that AI can improve decision-making, innovation, operational efficiency, and competitiveness, but the extent of these effects depends on organizational conditions. While some studies present AI as a direct source of competitive advantage, others argue that its impact is mediated by data quality, managerial capabilities, innovation culture, algorithmic governance, and strategic alignment. This creates a clear research gap. Despite the growing number of studies on AI and firm performance, there remains limited qualitative evidence on how AI is integrated into financial decision-making within established European industrial companies and how this integration contributes to competitive advantage. The analysis of Siemens AG, Schneider Electric SE, and Krka, d. d., Novo mesto, therefore, provides an opportunity to examine how AI, digital transformation,

financial planning, risk management, operational efficiency, and governance interact in different industrial contexts.

3. Scientific Research Methodology

This study uses a qualitative multiple-case study design to examine how artificial intelligence supports financial decision-making and competitive advantage in selected European industrial firms. This approach is appropriate because the study focuses on complex organizational processes that cannot be fully captured through quantitative indicators alone. The objective is not statistical generalization, but analytical generalization through the identification of patterns, mechanisms, and relationships between AI, financial decision-making, operational efficiency, governance, and competitiveness.

The selected cases are Siemens AG, Schneider Electric SE, and Krka, d. d., Novo mesto. These firms were selected through purposive and theoretical sampling, based on four criteria: European industrial relevance, availability of official corporate documents, evidence of digital transformation or technology-oriented management, and comparability across different industrial contexts. Siemens represents a digitally mature industrial technology group; Schneider Electric represents an industrial firm strongly oriented toward energy management, automation, and digital solutions; while Krka represents a pharmaceutical-industrial company with strong financial discipline, operational efficiency, and regional relevance in Slovenia.

The empirical analysis evaluates the 2024 corporate reporting period, using the most recent publicly available annual reports, sustainability reports, integrated reports, investor materials, and corporate governance documents published during 2024–2025. The desk-based document analysis was conducted during the manuscript preparation period for the EECME 2026 submission. This time frame was selected because it reflects the most recent corporate evidence available for assessing AI, digital transformation, financial decision-making, risk management, operational efficiency, and competitive positioning in the selected companies. The unit of analysis is the firm-level use of AI and digital technologies in financial decision-making, risk management, operational efficiency, governance, and competitive advantage. The study relies on secondary qualitative data obtained from official corporate sources. To ensure transparency and traceability, all documents were organized by company, year, document type, and thematic relevance. Table 1 presents the main elements of the research design, case selection, and data sources.

Table 1. *Research Design, Case Selection and Data Sources*

Component	Description
Research approach	Qualitative research approach
Research design	Multiple case study design
Research objective	To examine how artificial intelligence supports financial decision-making and competitive advantage in European industrial firms
Selected cases	Siemens AG, Schneider Electric SE, and Krka, d. d., Novo mesto
Case selection strategy	Purposive and theoretical sampling
Case selection criteria	Industrial relevance, European origin, AI/digital transformation orientation, availability of public corporate reports, comparability across cases, and inclusion of a Slovenian industrial firm
Unit of analysis	The firm-level use of AI and digital technologies in financial decision-making, risk management, operational efficiency, and competitive positioning
Data type	Secondary qualitative data
Main data sources	Annual reports, sustainability reports, integrated reports, investor presentations, strategic statements, corporate websites, and official public documents
Data organization	Documents will be classified by company, year, document type, thematic relevance, and analytical category
Analytical logic	Analytical generalization rather than statistical generalization

The data analysis followed four interrelated stages. First, thematic analysis was used to identify evidence related to AI, financial decision-making, operational efficiency, risk management, governance, sustainability, and competitive advantage. Second, cross-case analysis was applied to compare similarities and differences among Siemens AG, Schneider Electric SE, and Krka. Third, empirical–theoretical pattern matching was used to compare the findings with theoretical expectations from the literature on AI capabilities, decision-making, performance, and competitive advantage. Fourth, triangulation was applied by comparing evidence across different documents, companies, and analytical stages. Table 2 summarizes the analytical procedure and the strategies used to strengthen methodological rigor.

Table 2. *Analytical Procedure and Scientific Rigor*

Analytical stage	Purpose	Main procedure	Expected output	Contribution to rigor
Thematic analysis	To identify key themes related to AI, financial decision-making, risk management, efficiency, and competitive advantage	Systematic reading, coding, grouping of codes, and development of themes for each case	Thematic profile of each company	Ensures structured and transparent interpretation of secondary data
Cross-case analysis	To compare similarities and differences among the three firms	Comparison of themes across Siemens, Schneider Electric, and Krka	Cross-case matrix of common and case-specific patterns	Strengthens analytical validity and avoids isolated case interpretation
Pattern matching	To compare empirical findings with theoretically expected patterns	Matching observed evidence with theoretical expectations regarding AI, financial decision-making, efficiency, risk, and competitiveness	Assessment of theoretical consistency or deviation	Enhances internal validity and theoretical explanation
Triangulation	To integrate evidence from different sources, cases, and analytical stages	Cross-checking annual reports, sustainability reports, investor materials, and strategic documents	Integrated synthesis of findings	Improves construct validity, credibility, and robustness
Chain of evidence	To ensure traceability from findings to original sources	Linking codes, themes, and interpretations to specific documents	Transparent audit trail	Increases reliability and confirmability
Analytical generalization	To derive theoretically meaningful insights	Interpreting findings in relation to AI, financial decision-making, and competitive advantage literature	Conceptual and practical implications	Supports transferability to similar industrial contexts

This methodological design provides a structured and verifiable basis for analyzing the role of AI in financial decision-making and competitive advantage. By combining thematic analysis, cross-case comparison, pattern matching, and triangulation, the study reduces the risk of purely descriptive interpretation and strengthens the credibility of the findings. The approach also enables the study to compare firms with varying levels of digital maturity and to explain how AI, financial discipline, operational efficiency, governance, and sustainability interact to shape long-term competitiveness.

4. Results and Findings

4.1. Thematic Analysis of Case Studies

The findings are organized around the main themes identified across the three cases: AI and digital transformation, financial decision-making, operational efficiency, risk management, governance, sustainability, and competitive advantage. The results indicate that all three companies connect technology, financial decision-making, and strategic value creation, although the intensity and maturity of AI integration differ across cases.

Siemens AG shows the strongest AI-driven industrial profile among the selected firms. The company links AI with industrial digitalization, Siemens Xcelerator, generative AI, digital twins, automation, cybersecurity, predictive maintenance, and data strategy. AI is also connected with strategic governance and innovation, indicating that it is not treated as a peripheral technology but as part of the company's broader industrial transformation. From a financial perspective, Siemens connects digitalization and AI with capital efficiency, profitability, ROCE, cash conversion, and financial risk control. This suggests a mature digital-industrial model in which AI supports both operational efficiency and strategic and financial decision-making (Siemens, Annual Report, 2024; Siemens, Sustainability Report, 2024).

Schneider Electric SE also demonstrates a strong relationship between AI, digitalization, and competitive positioning. The company presents digitalization and AI as strategic megatrends within its industrial and sustainability-oriented business model. AI is linked to Industrial IoT, digital twins, automation, energy management, software, data centers, and integrated digital services. The company's reported financial performance, including revenue growth, adjusted EBITA margin, net profit, and free cash flow, shows that digital transformation is closely associated with value creation and profitable growth. Schneider Electric also emphasizes data-driven sustainability governance, including automated collection and analysis of sustainability-related data. This indicates that AI and digital technologies support both customer value creation and internal decision-making processes (Schneider Electric, Financial and Sustainable Report, 2025; Schneider Electric, Sustainable Development Report, 2024). Krka, d. d., Novo mesto presents a different profile. Unlike Siemens and Schneider Electric, AI is not reported as a dominant strategic theme in the company's official documents. However, Krka provides strong evidence of financial discipline, operational efficiency, process improvement, risk management, ESG governance, and pharmaceutical competitiveness. The company reports solid revenue growth, EBITDA, net profit, and ROE; reduced leverage; effective cash flow management; record production volumes; and improved supply chain flexibility. Therefore, Krka represents a more gradual digital transformation path, in which competitiveness is primarily supported by financial resilience, production capacity, quality control, risk management, and ESG-based governance rather than by explicit AI-driven industrial platforms (Krka, Novo mesto, Annual Report, 2024).

Table 3. *Thematic Findings by Case Study*

Case study	Dominant themes	Key evidence from official documents		Analytical interpretation
Siemens AG	Industrial AI, digital transformation, financial performance system, innovation, sustainability-oriented competitiveness	Siemens emphasizes automation, digitalization, Siemens Xcelerator, industrial and generative AI, Digital Industries, Smart Infrastructure, ROCE, profitability, capital efficiency, cash conversion, and sustainability impact.		Siemens represents a mature digital-industrial model where AI is integrated into strategic governance, innovation, operational efficiency and financial value creation.
Schneider Electric SE	Digitalization and AI, energy efficiency, Industrial IoT, financial value creation, sustainability governance	Schneider Electric identifies digitalization and AI as strategic megatrends and reports strong financial results, AI-enabled Industrial IoT solutions, digital twins, sustainability impact, and data-driven ESG governance.		Schneider Electric links AI and digitalization with energy management, customer value, profitable growth and competitive positioning in sustainability-driven industrial markets.
Krka, d. d., Novo mesto	Financial resilience, operational efficiency, risk management, ESG governance, pharmaceutical competitiveness	Krka reports strong revenue, EBITDA, net profit, ROE, low leverage, effective cash flow management, record production volumes, supply chain flexibility, ESG integration and corporate governance documents.		Krka shows a more conservative technology profile, where competitiveness is mainly built through financial discipline, production efficiency, risk control, quality and ESG-based governance.

Source: Author's own elaboration based on official company reports and corporate governance documents.

The thematic findings show two main patterns. Siemens AG and Schneider Electric SE exemplify AI-enabled industrial competitiveness, in which AI and digitalization are directly connected to innovation, operational efficiency, strategic decision-making, and financial value creation. Krka, by contrast, represents a financial-operational resilience model in which competitiveness is supported more strongly by financial discipline, production efficiency, risk control, quality, and ESG governance. These differences show that competitive advantage in European industrial firms can be built through different but complementary pathways.

4.2. Cross-Case Thematic Synthesis

The cross-case synthesis highlights clear differences in the way Siemens AG, Schneider Electric SE, and Krka, d. d., Novo mesto connect AI, digitalization, financial decision-making, governance, operational efficiency, and competitive advantage. Siemens AG and Schneider Electric SE show a more direct integration of AI and digital technologies into their industrial strategies, while Krka reflects a more gradual and financially disciplined model of digital transformation. Siemens AG links AI with industrial automation, Siemens Xcelerator, digital twins, Industrial Copilot, data analytics, and AI governance. Schneider Electric SE presents AI and digitalization as strategic megatrends that are connected to Industrial IoT, digital twins, energy management, data centers, and sustainable customer solutions. In both cases, AI is not limited to operational improvement; it functions as a strategic instrument for efficiency, innovation, and competitive positioning. Krka, d. d., Novo mesto presents a different pattern. AI is less explicit in its official reporting, while competitiveness is mainly associated with financial stability, effective cash flow management, low debt, production efficiency, supply chain flexibility, pharmaceutical product quality, and ESG governance. This makes Krka relevant for comparison, as it shows that industrial competitiveness can also be built through financial discipline and operational resilience, even when AI is not yet a dominant strategic theme. Overall, the three cases suggest that competitive advantage is not created by technology alone. It depends on firms' ability to integrate digital transformation, financial decision-making, governance, operational efficiency, and long-term value creation. Siemens and Schneider Electric represent AI-enabled industrial competitiveness, while Krka represents financial and operational resilience.

Table 4. *Cross-Case Thematic Synthesis*

Theme	Siemens AG	Schneider Electric SE	Krka, d. d., Novo mesto	Cross-case interpretation
AI and digital transformation	Strong focus on industrial AI, generative AI, Siemens Xcelerator and digital twins.	Digitalization and AI are strategic megatrends linked to Industrial IoT and digital services.	AI is less explicit; digital transformation appears mainly through process efficiency and governance.	Siemens and Schneider show direct AI integration, while Krka reflects a more gradual technology-oriented transformation.
Financial decision-making	Financial framework based on growth, profitability, ROCE, capital efficiency and cash conversion.	Financial performance is linked to efficiency, sustainability impact and shareholder value.	Focus on revenue growth, EBITDA, ROE, low debt and effective cash flow management.	All three firms connect strategic decisions with financial discipline and long-term value creation.
Operational efficiency	AI and automation support productivity, predictive maintenance and industrial optimization.	AI-enabled solutions support energy efficiency, automation and lifecycle services.	Efficiency is based on production scale, supply chain flexibility and quality control.	Operational efficiency is a shared source of competitiveness, but mechanisms differ across firms.

Risk management and governance	Emphasis on AI governance, cybersecurity, data strategy and financial risk control.	Integrated risk management, ESG governance and data-driven sustainability reporting.	Strong focus on risk management, ESG policy, compliance and corporate governance documents.	Governance strengthens responsible decision-making and supports resilience in all three cases.
Competitive advantage	Technology leadership through AI, automation and digital-industrial platforms.	Competitive positioning through electrification, digitalization, AI and sustainability solutions.	Competitiveness through quality, financial resilience, production capacity and market expansion.	The firms demonstrate different paths to competitive advantage: AI-platform leadership, AI-enabled efficiency, and operational-financial resilience.

Source: Author's own elaboration based on official company reports and corporate governance documents.

The synthesis confirms two main patterns. First, AI has a more direct role in Siemens AG and Schneider Electric SE, where it supports innovation, operational efficiency, and strategic positioning. Second, Krka demonstrates that competitiveness can also be achieved through financial discipline, production efficiency, risk control, and ESG governance. These findings indicate that European industrial firms may build competitive advantage through different but complementary pathways: advanced AI integration or prudent financial and operational resilience.

4.4. Empirical - Theoretical Pattern Matching

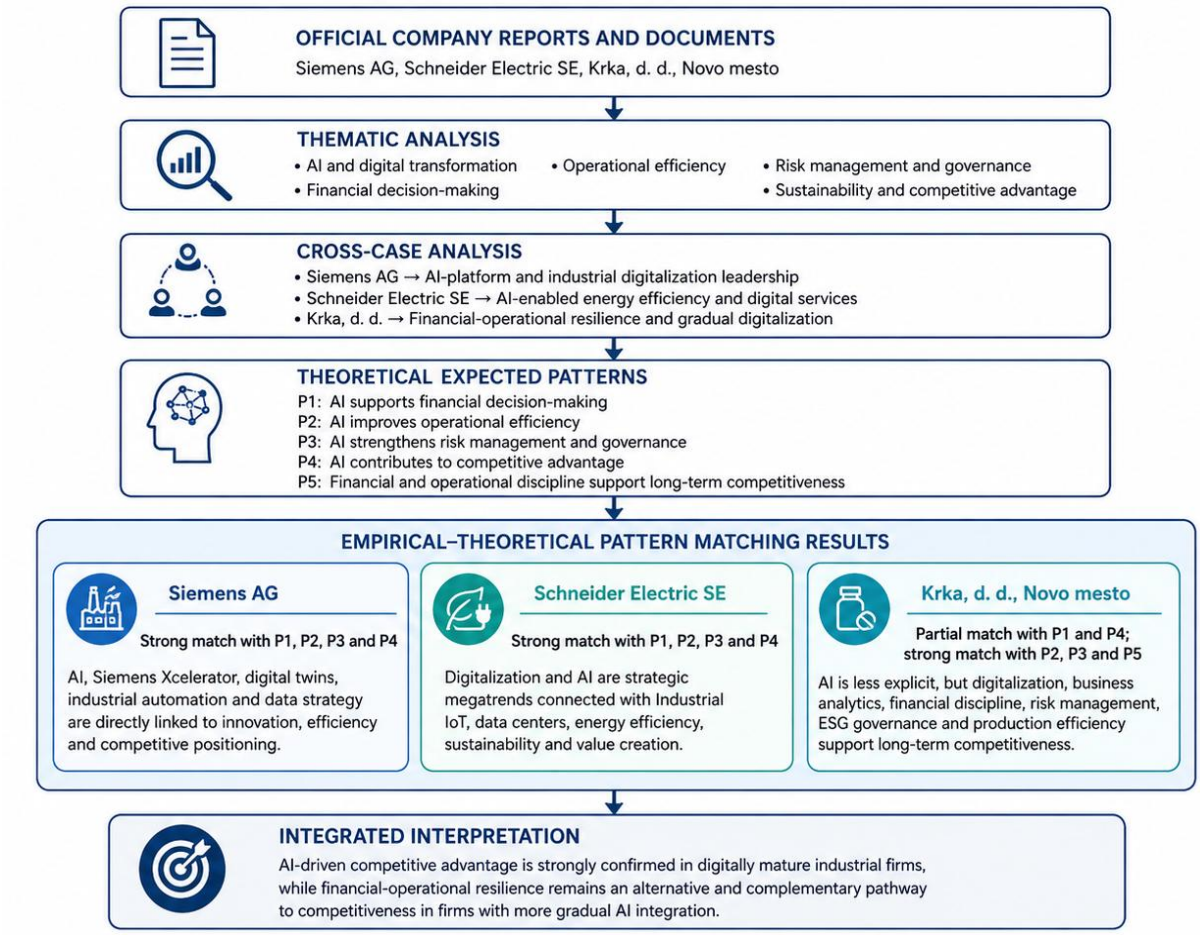
The empirical–theoretical pattern matching indicates different levels of alignment between the three cases and the theoretical expectation that AI supports financial decision-making, operational efficiency, governance, and competitive advantage. Siemens AG and Schneider Electric SE show a strong fit with the AI-driven competitiveness model, while Krka, d. d., Novo mesto shows a partial fit with this model and a stronger fit with the financial-operational resilience model.

In the case of Siemens AG, the theoretical model is strongly supported. The company links AI with Siemens Xcelerator, industrial AI, generative AI, digital twins, automation, innovation processes, data strategy, and productivity improvement. These elements show that AI is integrated into the company's industrial strategy and supports both operational efficiency and strategic and financial decision-making. Siemens also presents AI as a mechanism for process optimization, cost improvement, and the development of digital business models (Siemens, Annual Report, 2024).

Schneider Electric SE also shows strong alignment with the theoretical model. The company identifies digitalization and AI as strategic megatrends and links them to Industrial IoT, digital twins, energy management, data centers, software, and digital services. This confirms the theoretical expectation that AI supports not only internal efficiency and decision-making, but also market opportunities, customer value creation, and competitive positioning in industrial and sustainability-oriented markets (Schneider Electric, Financial and Sustainable Report, 2025).

In Krka, d. d., Novo mesto, the alignment with the AI-driven model is more partial and contextual. AI is not presented as a dominant strategic theme at the same level as in Siemens and Schneider Electric. However, the company reports developing business analytics through SAP BW/SAP HANA, using cloud solutions and artificial intelligence in its data strategy, and monitoring supply chain effectiveness through KPIs and OEE. This suggests a gradual model of digital integration, in which AI and analytics are primarily associated with operational control, efficiency, and decision-making support rather than with a broad industrial AI platform (Krka, Novo mesto, Annual Report, 2024).

Figure 1. *Empirical - Theoretical Pattern Matching Framework*



Source: Author's own elaboration based on official company reports and corporate governance documents.

Figure 1 summarizes the fit between empirical evidence and theoretical expectations. The strongest fit appears in Siemens AG and Schneider Electric SE, where AI is embedded in industrial strategy, digitalization, automation, data management, and value creation. Krka shows a more limited fit with the AI-driven model, but a strong fit with financial discipline, operational efficiency, risk management, and ESG governance. Overall, the findings suggest that competitive advantage in European industrial firms can be developed through two complementary pathways: advanced AI integration and digital platforms, or financial-operational resilience supported by governance and gradual digital transformation.

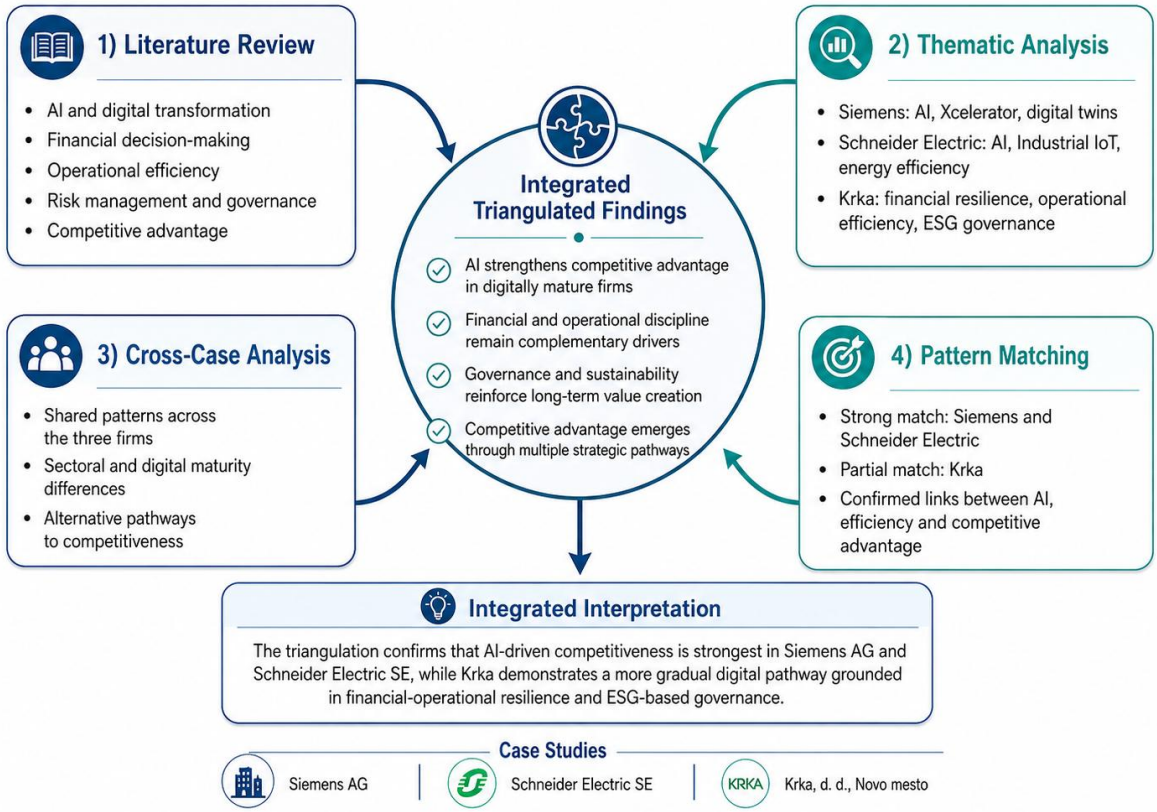
4.5. Triangulation Analysis

The triangulation analysis integrates the findings from the literature review, thematic analysis, cross-case synthesis, and empirical–theoretical pattern matching. The purpose is to assess whether evidence from different analytical levels supports a consistent interpretation of AI's role in financial decision-making and competitive advantage among European industrial firms.

Based on Figure 2, the results show a clear convergence between the theoretical arguments and the empirical evidence from the three case studies. The literature suggests that AI and digital transformation can improve financial decision-making, operational efficiency, risk management, governance, and competitive advantage. This expectation is strongly supported in the cases of Siemens AG and Schneider Electric SE, where AI is directly linked

to industrial strategy, automation, data analytics, digital platforms, and value creation. In the case of Krka, d. d., Novo mesto, the evidence indicates a more gradual digital transformation model, where competitiveness is more strongly associated with financial discipline, operational efficiency, risk control, and ESG governance.

Figure 2. *Integrated Triangulation of Review Literature, Thematic, Cross-Case, and Pattern Matching Findings*

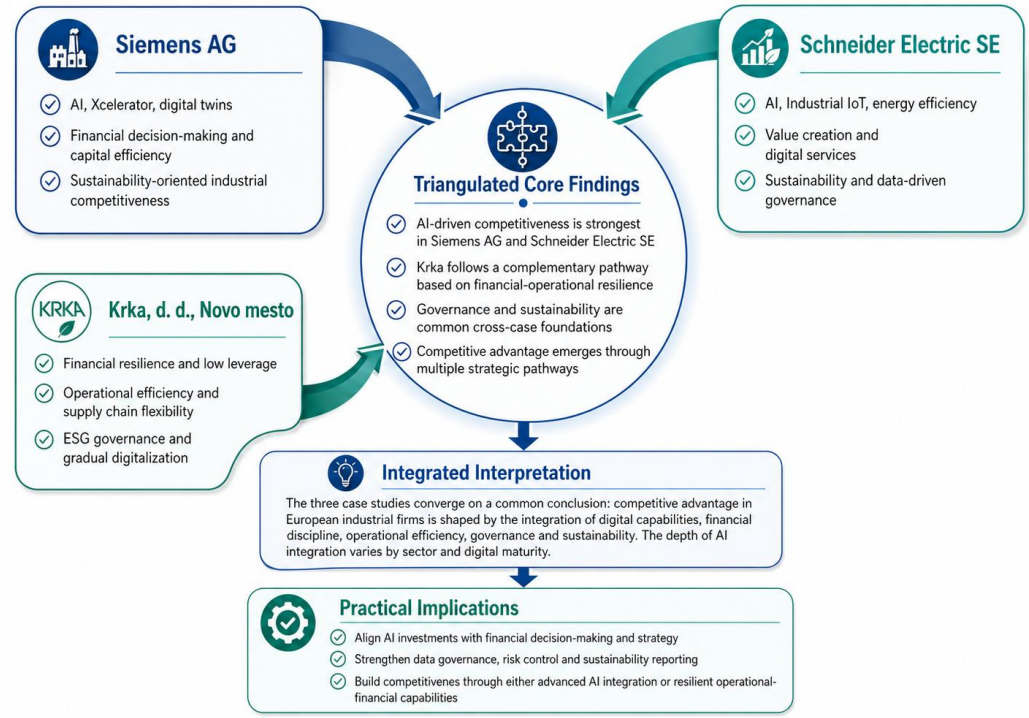


Source: Author's own elaboration based on official company reports and corporate governance documents.

A central result of the triangulation is that AI strengthens competitive advantage, particularly in firms with higher digital maturity. Siemens AG and Schneider Electric SE demonstrate how AI, automation, digital twins, Industrial IoT, advanced analytics, and data management can support operational efficiency, strategic decision-making, innovation, and market differentiation. At the same time, the case of Krka shows that financial and operational discipline remain important drivers of competitiveness when AI integration is less explicit. This makes the findings more balanced, because they show that European industrial firms may build competitiveness through both AI-enabled transformation and financial-operational resilience.

At the same time, the triangulation highlights an important additional result: financial and operational disciplines remain complementary drivers of competitiveness, especially when AI integration is less pronounced. This is particularly evident in Krka, where competitiveness relies more on financial resilience, low leverage, risk control, supply chain flexibility, manufacturing efficiency, and ESG governance. Therefore, the triangulation suggests that there are multiple strategic paths to competitive advantage: one based on advanced integration of AI and digitalization, and the other based on strengthening financial, operational, and governance capacities. This result makes the analysis more balanced and more relevant to the heterogeneous reality of European industrial firms.

Figure 3. *Curvilinear Triangulation Framework of the Three Case Studies*



Source: Author's own elaboration based on official company reports and corporate governance documents.

Figure 3 further clarifies each case's contribution to the overall interpretation. Siemens AG provides evidence of an AI-driven industrial competitiveness model in which AI supports digitalization, financial decision-making, innovation, and sustainability-oriented value creation. Schneider Electric SE confirms a model in which AI, Industrial IoT, energy efficiency, and digital services strengthen customer value and strategic positioning. Krka offers a complementary perspective, showing that competitiveness can also be supported by financial stability, production efficiency, risk management, ESG governance, and gradual digitalization.

Overall, the triangulation indicates that competitive advantage in European industrial firms does not depend on AI alone. Rather, it emerges from the interaction between digital technologies, financial decision-making, operational efficiency, governance, and sustainability orientation. The evidence therefore supports two complementary pathways: an AI-enabled competitiveness pathway, represented by Siemens AG and Schneider Electric SE, and a financial-operational resilience pathway, represented by Krka. d., Novo mesto. This integrated interpretation strengthens the study's argument that AI creates greater value when it is combined with strong governance, reliable data management, financial discipline, and organizational capabilities.

5. Discussion

The findings of this study show that artificial intelligence is becoming an important strategic capability for financial decision-making and competitive advantage in European industrial firms. However, its impact varies with firms' digital maturity, sectoral context, business model, and organizational capabilities. Siemens AG and Schneider Electric SE represent more advanced cases of AI-enabled industrial competitiveness, where AI is integrated into digital platforms, automation, digital twins, Industrial IoT, data analytics, governance, and value creation. In these firms, AI supports not only operational efficiency but also strategic and financial decision-making, including productivity improvement, cost optimization, risk management, and long-term competitive positioning.

The findings regarding Siemens AG and Schneider Electric SE are consistent with prior research indicating that digital culture strengthens organizational efficiency, innovation, adaptability, and sustainable competitive advantage. These two cases confirm that AI creates greater value when it is embedded within a broader organizational culture of digital transformation rather than being treated solely as a technological investment. The results also support the view that digital transformation depends not only on the adoption of AI, analytics, and automation, but also on digital agility, data fluency, strategic capability, and ethical governance. This indicates that AI-based competitiveness requires both technological infrastructure and organizational readiness. (Serafimova & Vasilev, 2024; Aškerc Zadravec et al., 2025)

In contrast, Krka, d. d., Novo mesto presents a more gradual digital transformation model. Although AI is not presented as a dominant strategic theme in its official documents, the company demonstrates strong financial discipline, risk management, production efficiency, supply chain flexibility, quality control, and ESG governance. This finding is comparable with previous evidence showing that management accounting practices, budgeting, performance evaluation, strategic analysis, and decision-making information are positively associated with financial performance in manufacturing companies. Therefore, the Krka case supports the view that financial discipline and performance monitoring can serve as important sources of competitiveness, especially as AI integration is still developing. (Yapa et al., 2025)

The role of sustainability and governance is also important in all three cases. Siemens AG and Schneider Electric SE link AI and digitalization with sustainability-oriented value creation, while Krka emphasizes ESG governance, risk control, and responsible management. These findings are consistent with research showing that sustainable strategies and compliance with European sustainability requirements can strengthen long-term value creation and competitiveness in the Slovenian business environment. In this respect, the present study extends previous findings by showing that sustainability and governance are not separate from AI-based competitiveness, but form part of the organizational conditions through which digital transformation creates value. (Lazar, 2025)

Overall, the discussion indicates that competitive advantage in European industrial firms can be built through two complementary pathways. The first is an AI-enabled competitiveness pathway, exemplified by Siemens AG and Schneider Electric SE, in which AI is directly integrated into industrial strategy, automation, innovation, and financial decision-making. The second is a financial-operational resilience pathway, represented by Krka, where competitiveness is based more strongly on financial discipline, production efficiency, risk management, ESG governance, and gradual digitalization. Compared with previous studies, this paper contributes by showing that AI does not automatically confer a competitive advantage; its value depends on the interaction among digital capabilities, financial decision-making, governance structures, sustainability orientation, and organizational maturity.

6. Conclusions and Recommendations

This study analyzed the role of artificial intelligence in financial decision-making and competitive advantage in selected European industrial firms, focusing on Siemens AG, Schneider Electric SE, and Krka. d., Novo mesto. The findings show that AI is becoming an important strategic capability for improving decision-making quality, operational efficiency, risk management, innovation, and long-term value creation. However, the impact of AI differs across firms depending on digital maturity, sector, business model, and organizational capabilities.

The main conclusion is that European industrial firms may build competitive advantage through two complementary paths. Siemens AG and Schneider Electric SE represent

an AI-driven competitiveness model in which AI is integrated across industrial strategy, digital platforms, automation, data analytics, sustainability, and financial value creation. Krka, d. d., Novo mesto represents a financial-operational resilience model, where competitiveness is supported by financial discipline, production efficiency, risk control, quality, ESG governance, and gradual digital transformation. This shows that AI can enhance competitiveness, but its value is greater when combined with strong governance, reliable data systems, financial controls, and sustainability-oriented decision-making.

Based on these findings, industrial firms should treat AI as part of their overall business strategy rather than as an isolated technology investment. AI initiatives should be linked to financial planning, cost control, risk management, productivity, cash flow, profitability, capital efficiency, and long-term shareholder value. Firms with higher digital maturity should focus on integrating AI into strategic decision-making, advanced analytics, cybersecurity, and innovation systems. Firms with lower digital maturity should adopt a gradual approach, first strengthening reporting systems, process automation, performance monitoring, supply chain management, financial controls, and ESG governance.

The study also has limitations. It is based on three case studies and secondary data from official corporate reports, which limits the generalizability of the statistical findings. Corporate documents may also reflect strategic narratives and may not fully capture the internal challenges of AI implementation. Future research should include more companies, longer time periods, interviews with managers and financial decision-makers, and quantitative testing of the relationship between AI adoption and financial indicators such as ROE, ROCE, EBITDA, cash flow, productivity, and profitability. A future AI maturity index for industrial firms could also provide a useful tool for comparing digital transformation, governance, operational efficiency, and financial performance across sectors.

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