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THE INFLUENCE OF ARTIFICIAL INTELLIGENCE LITERACY ON LEADERSHIP EFFECTIVENESS IN FINANCE INDUSTRY

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Abstract

This research investigates the impact of AI literacy on leadership effectiveness within the finance industry, a sector experiencing rapid digital transformation. As artificial intelligence becomes increasingly integrated into financial operations, leaders are required to possess not only traditional managerial skills but also a strong understanding of AI concepts, applications, and ethical considerations. Using a quantitative approach, data were collected from 55 finance professionals occupying leadership roles across various organizations. The study assessed their levels of AI literacy and examined its relationship with their perceived leadership effectiveness. The results reveal a significant positive correlation between AI literacy and leadership effectiveness, indicating that leaders with higher AI literacy are better equipped to drive innovation, make strategic decisions, and successfully adapt to technological change. These findings highlight the importance of integrating AI literacy into leadership development programs and fostering a culture of continuous learning to ensure sustained organizational agility and competitiveness in the finance sector.

Keywords : AI literacy, leadership effectiveness, finance industry, digital transformation, organizational performance

1. INTRODUCTION

The rapid advancement of artificial intelligence (AI) technologies has fundamentally transformed the finance industry, reshaping business models, operational processes, and decision-making paradigms. Financial institutions are increasingly leveraging AI-driven tools for tasks ranging from risk assessment and fraud detection to customer service and investment analysis. As these technologies become more deeply integrated into organizational workflows, the demand for leaders who possess not only traditional managerial competencies but also a strong understanding of AI and its applications has grown significantly.

AI literacy, defined as the knowledge, skills, and attitudes necessary to understand and effectively utilize AI technologies, has emerged as a critical competency for leaders in the digital era. Leaders with high AI literacy are better equipped to interpret complex data, drive

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innovation, and make informed strategic decisions that align with technological trends. In the finance industry, where accuracy, speed, and adaptability are paramount, AI-literate leaders can harness the power of automation and analytics to enhance organizational performance and maintain a competitive edge.

Despite the recognized importance of AI literacy, there remains a gap in empirical research examining its direct influence on leadership effectiveness within the finance sector. Leadership effectiveness is not only measured by the ability to achieve organizational goals but also by the capacity to inspire teams, manage change, and foster a culture of continuous learning. The intersection of AI literacy and leadership effectiveness is particularly relevant given the finance industry's ongoing digital transformation and the increasing complexity of its operating environment.

This study aims to address this gap by exploring the relationship between AI literacy and leadership effectiveness among finance professionals. AI literacy has become a core leadership competency in the financial sector, with finance professionals possessing high AI literacy demonstrating superior performance in technical understanding, critical evaluation, and practical application of AI technologies. Maspul & Putri (2025) in their research "Will Big Data and AI Redefine Indonesia's Financial Future?" found that AI implementation in Indonesian financial institutions resulted in unprecedented efficiency, innovation, and financial inclusion. This finding is reinforced by research conducted by Arif, et al (2025) who performed a comprehensive study on 66 Indonesian banks during the 2018-2023 period, proving that AI application has a positive and significant influence on financial performance measured through Return on Assets (ROA) and Return on Equity (ROE).

Reni, et al (2024) demonstrated that digital leadership strategies contribute 37% to the variability in employee innovation work behavior in an analysis of 100 financial cooperative employees, proving that leaders who integrate digital technology into their managerial strategies can encourage employees to be more creative and proactive. Wayan Sri Maitri, Komang Widhya Sedana Putra, and Ni Wayan Lasmi (2025) proved that AI adoption is a main driver of digital business success with financial management providing positive moderating effects, confirming that AI-literate leaders who combine technological competence with strong financial management achieve optimal results.

This accumulation of empirical evidence provides a strong foundation for the hypothesis that AI literacy directly correlates with leadership effectiveness in financial organizations, with Indonesian research showing that successful AI implementation requires leaders who possess both technical AI competency and strategic business acumen to navigate AI governance frameworks, integrate AI capabilities with traditional financial management principles, lead organizational digital transformation, leverage AI for enhanced risk management and decision-making accuracy, and drive employee innovation behavior through digital leadership strategies. In summary, understanding the influence of AI literacy on leadership effectiveness is essential for organizations seeking to thrive in the age of digital transformation. As the finance industry continues to evolve, equipping leaders with the necessary AI competencies will be a key driver of sustainable success and innovation.

2. RESEARCH METHODOLOGY

This study employs a quantitative research design to examine the influence of AI literacy on leadership effectiveness within the finance industry. The quantitative approach was chosen to enable objective measurement of variables and statistical analysis of the relationships between them. The research is explanatory in nature, aiming to test hypotheses regarding the impact of AI literacy on leadership outcomes.

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The population for this study comprises professionals working in various finance organizations, including banks, investment firms, insurance companies, and fintech enterprises. The sample consists of 55 respondents who hold managerial or leadership positions and are directly involved in decision-making processes related to technology adoption and organizational management. The sampling technique used is purposive sampling, ensuring that participants have relevant experience with AI-related initiatives in their organizations.

Data were collected using a structured online questionnaire distributed via email and professional networking platforms (such as LinkedIn). The questionnaire was designed to ensure anonymity and encourage honest responses. Prior to distribution, the instrument was reviewed by academic experts and industry practitioners to ensure clarity, relevance, and validity of the questions.

The research instrument is a self-administered questionnaire comprising three main sections:

a. Demographic Information:
   This section collects data on respondents' age, gender, educational background, years of experience in the finance industry, and current organizational role.
b. AI Literacy Scale:
   This section measures the respondents' knowledge, skills, and attitudes towards AI. It includes items assessing understanding of AI concepts, familiarity with AI tools and applications, and confidence in utilizing AI for decision-making. The scale uses a 5-point Likert format (1 = Strongly Disagree to 5 = Strongly Agree).
c. Leadership Effectiveness Scale:
   This section evaluates the effectiveness of respondents in their leadership roles, with items related to strategic decision-making, team management, adaptability to technological change, and ability to foster innovation. This scale also uses a 5-point Likert format and is adapted from established leadership assessment tools (e.g., Avolio & Bass, 2004).

Prior to the main data collection, a pilot test was conducted with 10 finance professionals to assess the reliability and validity of the instrument. Based on feedback, minor revisions were made to improve question clarity and relevance. The final Cronbach's alpha coefficients for both AI literacy and leadership effectiveness scales exceeded 0.80, indicating high internal consistency.

2.1. Data Analysis Technique

The collected data were analyzed using SPSS version 26. Descriptive statistics were used to summarize demographic characteristics and the central tendencies of each variable. Inferential statistical analysis, specifically multiple linear regression, was employed to test the hypotheses regarding the influence of AI literacy on leadership effectiveness. The significance level was set at $\alpha = 0.05$. Additional analyses, such as reliability tests (Cronbach's alpha) and validity checks (item-total correlations), were conducted to ensure the robustness of the measurement instruments.

2.2. Ethical Considerations

All participants were informed about the purpose of the study and provided informed consent prior to participation. Data confidentiality and anonymity were strictly maintained throughout the research process, and respondents were assured that their participation was voluntary and that they could withdraw at any time without consequence.

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3. RESULTS AND DISCUSSIONS

The results of this study are based on data collected from 55 finance industry professionals, analyzed using quantitative methods to determine the influence of AI literacy on leadership effectiveness. Descriptive statistics reveal that the average AI literacy score among respondents was high, with most leaders reporting familiarity with AI concepts, tools, and applications relevant to their roles. Leadership effectiveness scores were also above average, indicating that respondents generally perceived themselves as effective in strategic decision-making, team management, and adapting to technological changes.

Regression analysis showed a significant positive relationship between AI literacy and leadership effectiveness ($\beta = 0.47$, $p < 0.01$). This finding aligns with the argument of Kotler & Keller (2016), who emphasize that quantitative approaches and technological competency are critical in enhancing management effectiveness and organizational outcomes. The R^2 value of 0.52 indicates that 52% of the variance in leadership effectiveness can be explained by AI literacy, confirming the substantial impact of technological knowledge on leadership performance in the finance sector.

The results are consistent with previous studies in both marketing and management science, which highlight the importance of quantitative and data-driven approaches in decision-making. Chaffey & Ellis-Chadwick (2019) argue that digital literacy, including AI, equips leaders to respond quickly to market changes and make informed, strategic decisions that drive company growth.

In addition, research by Avolio & Bass (2004) on transformational leadership suggests that leaders who are technologically literate are more likely to inspire teams, manage change, and drive organizational performance. By fostering a culture of continuous learning and technological adaptation, finance organizations can ensure that their leaders remain effective in the face of ongoing digital transformation. Overall, the results demonstrate that AI literacy is a significant predictor of leadership effectiveness in the finance industry. Leaders who possess strong AI competencies are not only better equipped to manage technological change but also more effective in guiding their organizations through complex and rapidly evolving environments. These findings highlight the need for ongoing AI education and training as a strategic priority for leadership development in the finance sector.

To ensure the quality and consistency of the measurement instruments, both reliability and construct validity were rigorously assessed for the AI Literacy and Leadership Effectiveness scales. Reliability was evaluated using Cronbach's alpha. The AI Literacy scale achieved a Cronbach's alpha of 0.87, while the Leadership Effectiveness scale scored 0.85. Both values are well above the commonly accepted threshold of 0.70, indicating excellent internal consistency and suggesting that the items within each scale reliably measure the same underlying construct.

Construct validity was assessed using the Kaiser-Meyer-Olkin (KMO) measure and Bartlett's Test of Sphericity. The KMO values were 0.82 for AI Literacy and 0.79 for Leadership Effectiveness, both surpassing the recommended minimum of 0.70, which indicates sampling adequacy for factor analysis. Bartlett's Test of Sphericity was highly significant for both scales ($p < 0.001$), confirming that the correlation matrices are not identity matrices and that the data are suitable for structure detection.

Table 1. Reliability and Validity

Scale	Cronbach's Alpha	KMO	Bartlett's Test (p-value)
AI Literacy	0.87	0.82	< 0.001

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Leadership Effectiveness	0.85	0.79	< 0.001

The relationships between the primary variables were examined using Pearson correlation and multiple regression analysis. Correlation analysis revealed a strong positive relationship between AI Literacy and Leadership Effectiveness, with a Pearson correlation coefficient of $r = 0.72$ ($p < 0.001$). This indicates that as AI literacy increases, leadership effectiveness also tends to rise significantly among finance professionals.

Regression analysis further supported these findings. The regression model showed that AI Literacy is a significant predictor of Leadership Effectiveness ($\beta = 0.47$, $p < 0.01$), explaining 52% of the variance in leadership effectiveness ($R^2 = 0.52$). This demonstrates not only a strong individual relationship but also a substantial overall impact of AI literacy on effective leadership in the finance industry.

Table 2. Variable Relationships

Variable Relationship	Pearson's r	p-value	Regression β	R^2	Model Significance (p)
AI Literacy ↔ Leadership Effectiveness	0.72	< 0.001	0.47	0.52	< 0.01

4. CONCLUSIONS

This research demonstrates that AI literacy is a critical determinant of leadership effectiveness in the finance industry. The quantitative analysis of 55 finance professionals revealed a significant positive relationship between leaders' AI literacy and their ability to drive strategic decision-making, manage teams, and adapt to technological change. These findings are strongly supported by the literature, which consistently highlights that AI literacy empowers leaders to interpret complex data, predict trends, and make informed, ethical, and innovative decisions.

As the finance sector undergoes rapid digital transformation, leaders who possess a deep understanding of AI concepts, applications, and limitations are better positioned to leverage AI as a competitive differentiator. AI literacy enables leaders to automate routine tasks, enhance forecasting accuracy, improve risk management, and deliver real-time insights, all of which contribute to greater operational efficiency and organizational performance. Furthermore, fostering a culture of AI literacy across all organizational levelsrather than confining expertise to technical teams breaks down silos, enhances collaboration, and accelerates innovation.

The results also underscore the strategic imperative for finance organizations to invest in continuous AI education and training. Not only does this build individual competencies, but it also ensures responsible and ethical AI adoption, compliance with emerging regulations, and the ability to communicate AI-driven insights to stakeholders in clear, actionable terms. Ultimately, AI literacy is no longer a technical add-on but a foundational business competency that underpins sustainable leadership and future growth.

Based on the findings and discussion presented in this study, several practical recommendations can be proposed to enhance leadership effectiveness through improved AI literacy in the finance industry. Organizations are encouraged to integrate AI literacy into their leadership development programs, ensuring that both current and future leaders possess the necessary skills and understanding to leverage AI responsibly and strategically. This can be

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achieved by embedding relevant modules within training curricula, supporting hands-on experimentation with AI tools, and fostering a culture of continuous learning and knowledge sharing across departments.

Furthermore, it is essential for finance leaders to align AI initiatives with broader business strategies, identifying key areas where AI can create tangible value such as automating routine tasks, improving forecasting accuracy, or enhancing risk management. Establishing clear governance frameworks will help ensure the ethical and responsible use of AI, emphasizing transparency, fairness, and compliance with regulatory standards. Regularly measuring and communicating the impact of AI initiatives in accessible language will also help build trust and engagement among stakeholders at all levels. By prioritizing AI literacy throughout the organization, finance companies can unlock the full potential of AI, drive ongoing innovation, and sustain a competitive advantage in an increasingly digital and data-driven environment.

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