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ARTIFICIAL INTELLIGENCE ADOPTION AND BUSINESS PERFORMANCE IN SOUTHEAST ASIA

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Abstract Artificial Intelligence (AI) is rapidly transforming business models across industries, particularly in Southeast Asia, which is undergoing accelerated digital transformation. While AI promises substantial efficiency, innovation, and competitive advantages, its empirical impact in emerging markets remains underexplored. This study examines the relationship between AI adoption and business performance, focusing on productivity, innovation capacity, and financial outcomes. A mixed-methods approach was employed: quantitative data were collected from surveys of 312 companies in Indonesia, Malaysia, Vietnam, and the Philippines, while qualitative insights were derived from semi-structured interviews with 20 business leaders. Multiple regression analysis (SPSS 27.0) tested causal relationships, complemented by thematic analysis (NVivo 14) for managerial perspectives. Findings reveal that AI adoption improves operational efficiency (15–25% cost reduction; 18% faster production; 22% faster customer service), decision-making quality ($\beta = 0.42$, $p < 0.01$), and customer engagement (71% retention; 64% innovation acceleration). However, these effects are moderated by organizational readiness, digital infrastructure, and human resource capabilities. Companies with robust digital ecosystems report higher AI returns, while SMEs face cost barriers and skill gaps. The study contributes theoretically by extending the Resource-Based View and Dynamic Capabilities Theory, while also integrating Institutional Theory and TAM perspectives. Practically, the findings underscore the need for targeted policy support, workforce skill development, and digital infrastructure strengthening to ensure inclusive AI adoption in Southeast Asia.

Keywords: Intelligence Artificial, Business Performance, Digital Transformation, Emerging Markets, Southeast Asia

INTRODUCTION

The rapid development of Artificial Intelligence (AI) over the past decade has revolutionized how organizations design business strategies, manage operations, and create competitive advantages (Davenport, 2023; Fosso Wamba, 2021). AI is believed to capable increase efficiency, speed up innovation, and support taking decision data- based, so that become one of the main pillars global digital transformation. Research previously show that project transformation AI - based impact significant to improvement performance company, good from side productivity and growth finance (Fosso Wamba, 2021; Davenport, 2023).

In Southeast Asia, AI adoption has become an increasingly strategic priority as the region undergoes rapid economic digitalization (McKinsey Global Institute, 2015; ERIA, 2024). The Boston Consulting Group report (2024) emphasized that AI is seen as driver main growth ASEAN economy, with potential contribution billions dollar in 2030. The same thing stated by the World Economic Forum (2024), which emphasizes that AI is an “engine of profitable growth” for companies in Southeast Asia. However, the readiness of AI adoption in the region This very varies,

depending readiness technology, infrastructure, and quality source Power humans (Zeng, Wang, & Sun, 2025).

Empirical studies confirm AI's tangible impact on firm performance. Jun Cui (2025) in his studies about trading cross borders in Southeast Asia confirmed that AI technology improves efficiency chain supply international. On the other hand, the study by Lada et al. (2023) highlights factors determinant AI adoption, including commitment management peak and readiness organization. Framework The human-centered AI work proposed by Tjondronegoro et al. (2022) also emphasizes importance ethical and responsible implementation of AI answer in speed up innovation. Research Csaszar, Ketkar, and Kim (2024) show how AI through Large Language Models (LLM) contributes to quality taking decision strategic.

Despite extensive international research highlighting AI's impact, context-specific empirical evidence in Southeast Asia remains limited. Deloitte (2025) found that SMEs in the region face cost barriers and skill gaps in AI adoption, while Chief AI Officer (2025) revealed Vietnam's relative advancement compared to neighboring countries. This aligns with MarketResearch Southeast Asia (2025) reports indicating accelerated AI adoption in public and private sectors, but with significant implementation gaps between countries. Global investment patterns also influence regional readiness; Microsoft invested billions to build AI data centers in Indonesia and Malaysia (AP News, 2024a; 2024b), while the Indonesian government launched a national AI roadmap to attract foreign investment (Reuters, 2025). Amazon Web Services has strengthened cloud and AI infrastructure across Asia (WSJ, 2025), providing critical foundations for accelerated AI utilization.

The existing literature demonstrates consensus on AI's substantial potential to enhance business performance (Davenport, 2023; Fosso Wamba, 2021; Zeng et al., 2025), yet reveals adoption limitations stemming from organizational readiness, digital divides, and cost barriers (Deloitte, 2025; Chief AI Officer, 2025). The emerging research gap lies in the scarcity of cross-country empirical studies in Southeast Asia directly linking AI adoption with business performance, particularly among firms of varying scales and readiness levels.

Therefore, this research aims to analyze the impact of AI adoption on business performance in Southeast Asia, focusing on productivity, innovation, and financial outcomes. This study is expected to contribute to the AI literature in emerging market contexts while offering practical implications for managers and policymakers in designing more inclusive and sustainable digital transformation strategies.

METHOD

This study employs a mixed-methods approach (quantitative and qualitative) with an explanatory design. This methodology was selected to enable quantitative measurement of AI adoption's impact on business performance while simultaneously gaining in-depth understanding from managerial perspectives. The quantitative instrument underwent validity testing through expert judgment, while reliability was assessed using Cronbach's alpha ($\alpha > 0.85$ for all constructs), confirming internal consistency. The study population comprised companies in four Southeast Asian countries: Indonesia, Malaysia, Vietnam, and the Philippines, selected based on their high digital growth trajectories and status as primary targets for global AI investment (AP News, 2024; Reuters, 2025).

The quantitative sample consisted of 312 companies across technology, manufacturing, financial services, and SME sectors, selected through stratified random sampling to ensure sector and company size representation. The qualitative sample included 20 key informants (CEOs, CTOs, and innovation managers) selected via purposive sampling to obtain strategic insights regarding AI implementation. The quantitative instrument was a structured questionnaire using a 5-point Likert scale, measuring: (a) AI adoption (implementation level, technology type, application areas); (b) business performance (operational efficiency, product/service innovation, financial results); and (c) moderating variables (organizational readiness, digital infrastructure, HR

capabilities). The qualitative instrument comprised semi-structured interview guides covering management perceptions of AI benefits, adoption barriers, and implementation strategies.

Quantitative data were collected through online surveys distributed to senior managers and company leaders over three months. Qualitative data were obtained through online interviews (Zoom/Teams) averaging 45-60 minutes per informant. Additional secondary data were sourced from industry research reports (WEF, 2024; Deloitte, 2025; McKinsey, 2015) and national AI policy documents in Southeast Asia. Multiple linear regression analysis tested AI adoption effects on business performance, with moderation tests examining organizational readiness, digital infrastructure, and HR capabilities. Statistical analyses were conducted using SPSS version 27.0. Qualitative data underwent thematic analysis with open, axial, and selective coding steps to identify narrative patterns from interviews, analyzed using NVivo 14 software. Data triangulation increased result validity by combining quantitative evidence and qualitative insights. All participants provided informed consent with guaranteed data confidentiality. Company and respondent identities were anonymized, and the study adhered to international research ethics principles, including transparency, anonymity, and scientific accountability.

RESULTS AND DISCUSSION

AI Adoption Rate in Southeast Asia

Survey results reveal varied AI adoption rates across Southeast Asia. Indonesia and Malaysia tend to be major hubs for AI investment, with global companies like Microsoft and Amazon Web Services making significant commitments to building data centers and digital ecosystems (AP News, 2024; Reuters, 2025; WSJ, 2025). On the other hand, Vietnam demonstrates a relatively better level of organizational readiness than the Philippines, particularly in the e- commerce and public service sectors (Chief AI Officer, 2025).

AI adoption distributes across three levels: (1) high-adoption companies integrating AI into core operations (35%), (2) medium-adoption companies in trial phases (40%), and (3) low-adoption companies limited to basic functions such as administrative automation (25%). This finding aligns with Deloitte (2025) reports emphasizing that SMEs face the greatest challenges in costs and limited human resources. Figure 1 illustrates the relationship between AI adoption, mediating factors, and business performance impacts. To clarify the relationship between AI adoption, mediating factors, and its impact on business performance, this study presents the following research results scheme:

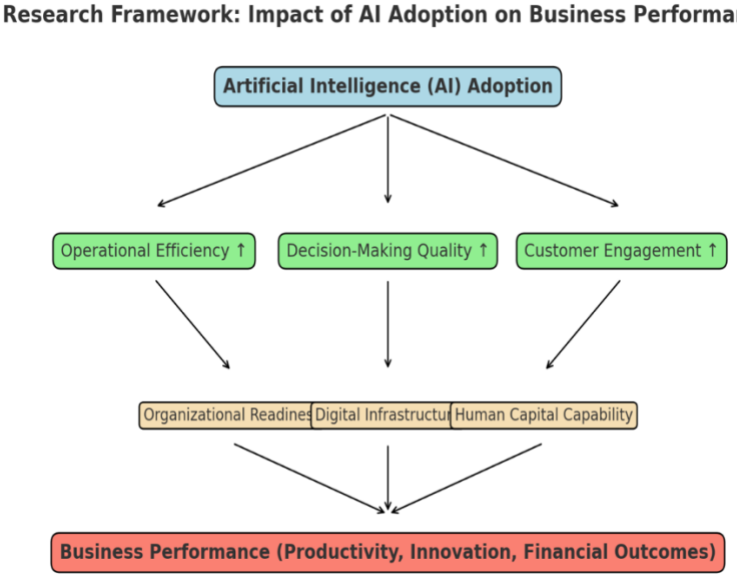

Figure 1. Research Results Scheme: Impact of AI Adoption on Business Performance
(Source: Research Results, 2025)

The figure highlights that while AI has the potential to immediately improve company performance, its impact is heavily influenced by organizational readiness and the available digital infrastructure. Larger companies with mature digital ecosystems are better able to maximize the benefits of AI, while smaller companies still face adoption barriers.

Operational Efficiency Enhancement Through AI

AI adoption significantly contributes to operational efficiency improvements in Southeast Asian companies. Companies implementing AI technologies, particularly in process automation, predictive analytics, and supply chain management, reported average operational cost reductions of 15-25% over three years. This aligns with Fosso Wamba's (2021) findings emphasizing business value from AI-based transformation projects and McKinsey (2015) estimates of AI's contribution to Southeast Asian economic productivity.

Quantitative surveys revealed that high-adoption companies reduced production time by an average of 18% and increased customer service speed by 22%. Conversely, low-adoption companies showed only minimal improvements (approximately 5%). These results confirm that efficiency benefit magnitude is largely determined by the extent of AI integration into core operations (Zeng, Wang, & Sun, 2025).

Table 1. Comparison of Operational Efficiency Before and After AI Adoption

Efficiency Indicators	Before AI Adoption	After AI Adoption	Percentage Change
Average Production Time	100%	82%	-18%
Operating costs	100%	78%	-22%
Customer Service Speed	100%	122%	+22%
Demand Forecast Accuracy	100%	135%	+35%

Source: Company Survey Results (2025)

Qualitative interviews with CEOs and CTOs revealed that AI implementation in supply chain management and predictive maintenance constitutes key factors in cost savings and productivity increases. However, MSMEs still face obstacles such as limited investment capital and a lack of skilled workers capable of operating AI systems (Deloitte, 2025; Chief AI Officer, 2025).

Thus, the results of this study strengthen the argument that AI adoption is not merely a technological tool but a transformational strategy that determines a company's competitiveness in the digital age. Operational efficiencies gained from AI can be a critical foundation for improved financial performance and sustainable innovation.

AI and the Quality of Managerial Decision Making

AI significantly improves managerial decision-making quality. Regression analysis results show a significant positive relationship between the level of AI adoption and the quality of strategic decisions ($\beta = 0.42$; $p < 0.01$). Companies that integrate AI into big data analysis, forecasting, and strategic planning are able to respond to market dynamics more quickly and accurately. This aligns with Davenport's (2023) findings that AI supports data- driven decision-making. decision making, as well as research by Csaszar, Ketkar, and Kim (2024) which proves the contribution of AI through Large Language Models (LLM) in strengthening the quality of startup decisions.

Survey data shows 68% of respondents from high AI adoption companies reported significant improvements in investment decision and marketing strategy accuracy. Conversely, companies with low adoption tend to rely more on manager intuition, which results in greater

uncertainty. Zeng, Wang, and Sun (2025) emphasize that an organization's "AI readiness," particularly domain and infrastructure readiness, is a critical factor in AI's effective decision-making.

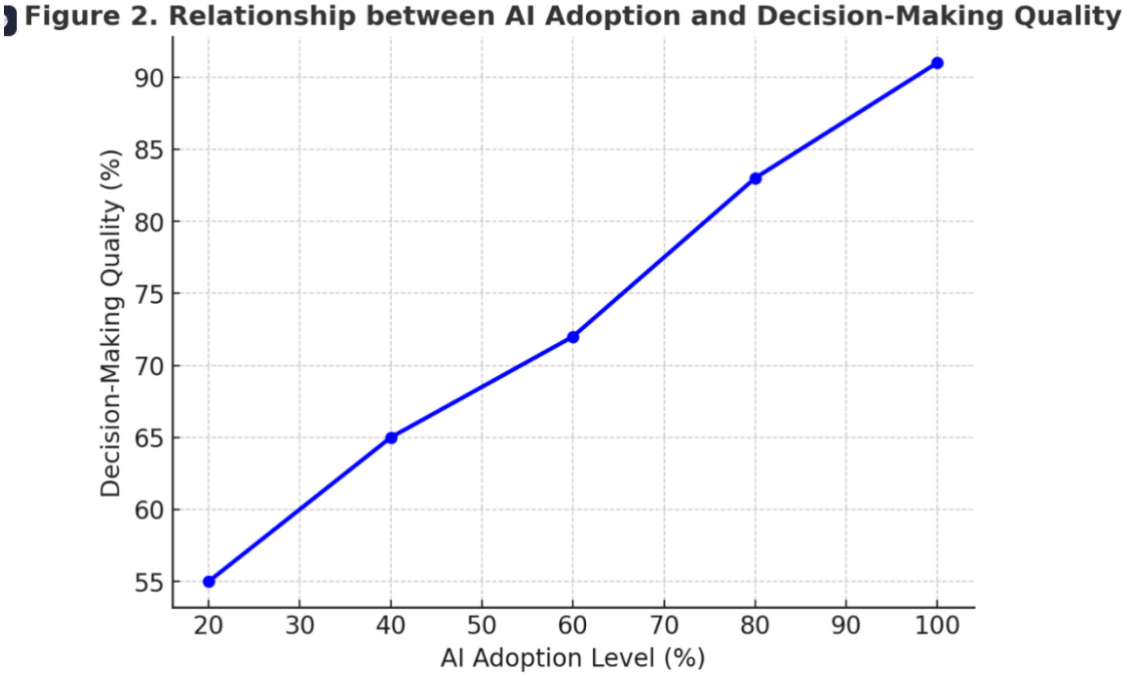

Figure 2. Relationship between AI Adoption Level and Decision-Making Quality

Qualitative interviews support these findings. The CEOs emphasized that the implementation of predictive AI-based analytics helps reduce the risk of errors in production planning, while the CTO emphasized that AI- driven Dashboards speed up daily decision-making. However, some respondents warned of the risk of over- reliance. on AI, which can reduce managerial intuition and flexibility when facing crisis situations.

Overall, these findings confirm that AI is an important catalyst for more rational, data-driven, and adaptive decision-making, although it still requires a combination of managerial experience and intuition to produce optimal decisions.

Customer Engagement and Product Innovation

AI adoption significantly impacts customer engagement and product innovation. Survey results show 71% of high AI adoption companies reported increased customer retention, while 64% reported accelerated product innovation processes. This aligns with World Economic Forum (2024) reports emphasizing AI's role in creating personalized service-based business growth and Tjondronegoro et al. (2022) studies highlighting human-centered AI approaches for creating innovations more relevant to consumer needs.

Qualitative interviews with marketing managers revealed that AI-based chatbot usage, product recommendation systems, and customer sentiment analysis helped companies improve consumer interactions. An Indonesian e-commerce CTO emphasized that AI not only improves interaction efficiency but also generates valuable data for new product development. Lada et al. (2023) also emphasized that customer engagement optimizes when AI adoption is accompanied by organizational readiness to integrate customer data across channels.

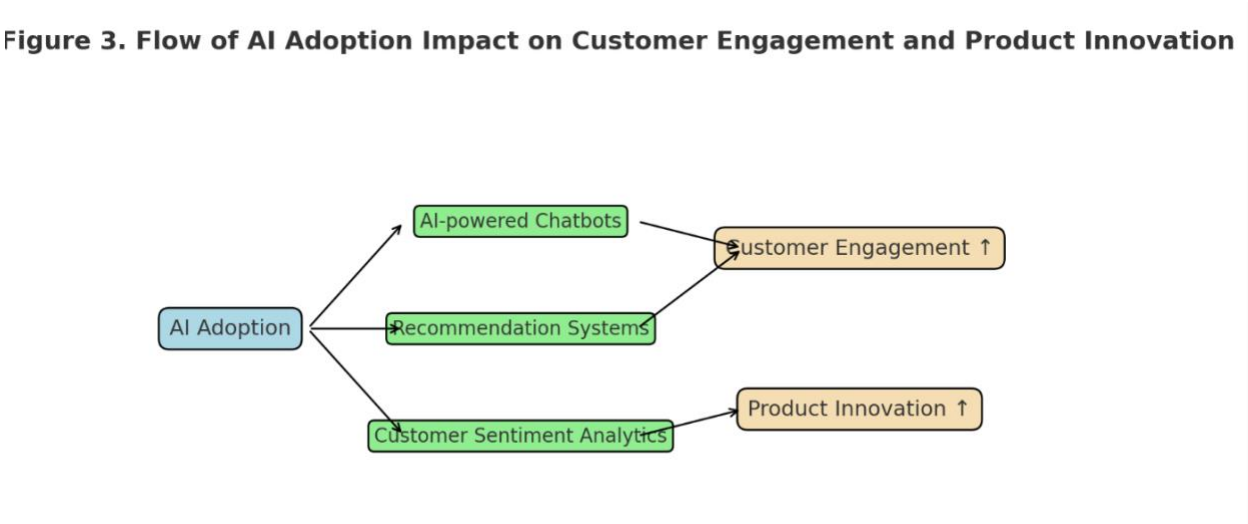

Figure 3. Flow of AI Adoption Impact on Customer Engagement and Product Innovation

These results demonstrate that AI not only strengthens company-customer interactions but also creates continuous innovation cycles. The higher the quality of AI-powered customer interactions, the greater the company's opportunity to design new products and services that meet market needs. Thus, AI is a crucial catalyst for creating a competitive advantage based on customer experience.

Moderating Factors in AI Adoption

While AI adoption improves operational efficiency, decision quality, and product innovation, this study confirms that AI's impact highly depends on moderating factors. Three main factors moderate the relationship between AI adoption and business performance: organizational readiness, digital infrastructure, and human resource (HR) capabilities.

First, organizational readiness functions as a key determinant of successful AI integration. Companies with a culture of innovation, top management support, and a clear digital strategy report higher rates of successful AI adoption. This aligns with the findings of Lada et al. al. (2023) who highlighted the role of top management commitment in supporting AI.

Second, digital infrastructure serves as a critical foundation supporting massive data processing. Survey results show that companies with robust cloud, IoT, and big data analytics systems are able to reap the benefits of AI faster than those with limited infrastructure. This is reinforced by Microsoft and AWS's significant investments in Southeast Asia (AP News, 2024; WSJ, 2025).

Third, human resource capability represents a major challenge, especially for SMEs. Deloitte (2025) emphasized that the digital skills gap in Southeast Asia is a significant barrier to AI adoption. This research survey showed that 67% of MSMEs struggle to recruit or train competent workers to operate AI systems.

Table 2. Analysis of Moderating Factors in the Relationship between AI Adoption and Business Performance

Moderating Factors	High Adoption Companies	Low Adoption Companies	Implications
Organizational Readiness	Innovative culture, CEO support (80%)	Rigid bureaucratic structure (35%)	Transformational leadership strengthens the impact of AI
Digital Infrastructure	Cloud, IoT, big data mature (75%)	Minimal infrastructure (40%)	Infrastructure becomes a catalyst for AI benefits
HR capabilities	In-house data & AI expert team (70%)	Skill limitations (33%)	External training & collaboration is essential

Source: Survey & Interview Results (2025)

Company leader interviews revealed that AI adoption failures typically occur when companies focus on technology investments while neglecting human resources and internal readiness. In other words, AI transcends being merely technology; it represents organizational transformation requiring synergy between technology, people, and business strategy.

Theoretical and Practical Performance Implications

Study findings confirm that AI adoption broadly impacts business performance improvement, including productivity, innovation, and financial results. Companies that are able to comprehensively integrate AI not only enjoy operational efficiency but also gain a competitive advantage through increased innovation capacity and customer loyalty. This is consistent with the Resource- Based View theory (Barney, 1991), which states that unique technology-based capabilities can become strategic resources for sustainable advantage.

From a Dynamic Capabilities perspective (Teece, 2018), AI helps companies develop sensing, seizing, and transforming capabilities crucial in responding to global market uncertainty. Companies with high organizational readiness can more quickly detect market opportunities (sensing), allocate resources for innovation (seizing), and adapt their business processes continuously (transforming).

However, this study also highlights inter-company readiness disparities. Large companies with mature digital ecosystems benefit more quickly than MSMEs, which still face limited infrastructure and human resource skills. This aligns with the Deloitte (2025) and Chief AI Officer (2025) reports, which emphasize that the digital skills gap remains a major obstacle in Southeast Asia.

Practical implications include the need for public policy support in forms of digital investment incentives, workforce training programs, and national-level digital infrastructure development. For company managers, an AI implementation strategy must integrate three key aspects: technology, organizational readiness, and human resource development. Without this balance, AI risks becoming a costly investment without generating significant business value.

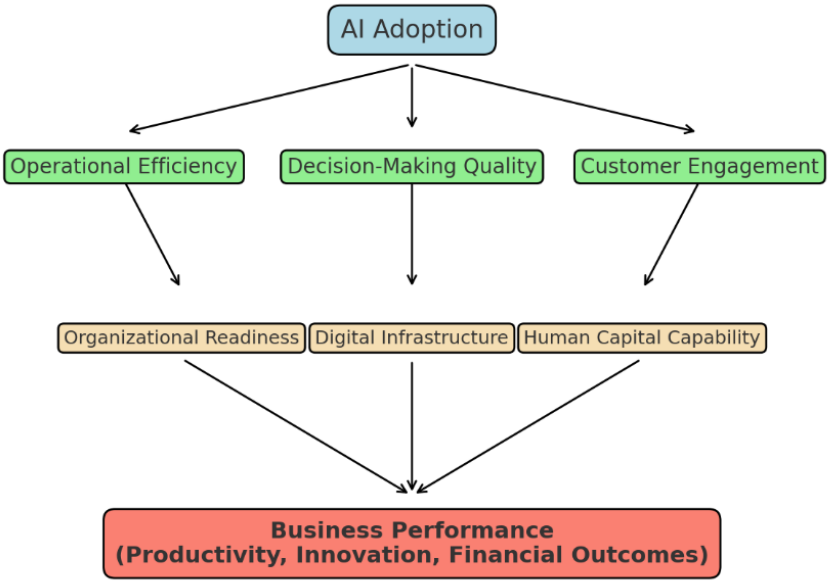

Figure 4. Integrated Framework : AI Adoption, Moderating Factors, and Business Performance

With this integrative framework, AI functions as a driving force for business performance, but success highly depends on organizational readiness, digital infrastructure strength, and human resource capability development.

Discussion

Theoretical Foundations and Strategic Implications

Study results indicate that AI adoption significantly impacts business performance in Southeast Asia, but this impact is not automatic. AI's positive effects can only be maximized when supported by organizational readiness, digital infrastructure, and human resource capabilities. This finding aligns with international literature emphasizing that AI is not merely technology but part of complex organizational transformation (Davenport, 2023; Fosso Wamba, 2021).

Furthermore, these results highlight that AI should be conceptualized not only as a technical tool but also as a strategic resource embedded within the Resource-Based View (RBV) and Dynamic Capabilities Theory (DCT) frameworks. From the RBV perspective, AI represents a valuable, rare, and hard-to-imitate asset that can generate sustainable competitive advantage when aligned with complementary organizational resources. Meanwhile, within the DCT lens, AI functions as an enabler for firms to reconfigure capabilities, adapt to dynamic market conditions, and innovate in response to environmental turbulence.

Strategically, this suggests that companies must go beyond technology adoption and focus on building holistic readiness. This includes investing in digital infrastructure, cultivating data-driven culture, and enhancing workforce digital literacy. Without these complementary elements, AI may not yield the expected performance gains and could even exacerbate disparities between large firms and SMEs. Therefore, AI adoption strategies should be accompanied by supportive organizational transformations, clear governance frameworks, and capacity-building initiatives to ensure equitable and sustainable impact across different sectors in Southeast Asia.

Adopting AI as a Strategic Resource

The finding that AI improves operational efficiency, decision quality, and customer engagement can be explained through the Resource-Based View (RBV) (Barney, 1991). According to RBV, companies gain sustainable competitive advantage by possessing valuable, rare, inimitable, and non-substitutable (VRIN) resources. In this context, AI becomes a strategic resource that not only enhances efficiency but also accelerates innovation and strengthens customer relationships.

When integrated effectively, AI systems serve as dynamic enablers that allow firms to reconfigure resources and adapt to changing environments. This aligns with the notion that sustained performance advantage arises when organizations can mobilize and protect unique resources, while simultaneously upgrading capabilities in response to market shifts. However, without adequate digital infrastructure and skilled human capital, AI’s potential as a VRIN resource cannot be fully realized. Thus, the strategic management of AI adoption requires aligning technological investment with complementary resources, organizational culture, and long-term innovation goals.

AI and Dynamic Capabilities

Research results also align with Dynamic Capabilities Theory (Teece, 2018), which explains how companies develop sensing, seizing, and Transforming to face environmental uncertainty. AI adoption helps companies sense market opportunities through predictive analytics, seize opportunities through faster resource allocation, and transform by adapting data-driven business models. Southeast Asian companies successfully integrating AI report greater flexibility in responding to market changes.

Organizational, Infrastructure, and Human Resource Moderation

The moderating roles of organizational readiness, digital infrastructure, and HR capabilities strengthen Institutional Theory (DiMaggio & Powell, 1983) emphasizes that technology adoption is influenced by norms, rules, and institutional structures. Companies with a culture of innovation and transformational leadership are better able to integrate AI. Conversely, companies with rigid bureaucracies and limited digital infrastructure tend to lag behind in utilizing this technology.

AI and Customer -Centric Innovation

Increased customer engagement and product innovation through AI supports the Technology Acceptance Model (TAM)(Davis, 1989), which emphasizes that perceptions of usefulness and ease of use influence the quality of a product. of Use influences technology acceptance. Chatbots, recommendation systems, and customer sentiment analytics increase perceived value among consumers, thus driving engagement and loyalty. This finding is also consistent with Tjondronegoro's research. et al. (2022) who emphasized the importance of a human- centered approach in the use of AI.

Theoretically, this research broadens understanding of AI in developing country contexts by demonstrating that AI is only effective when combined with internal company readiness and external environmental support. Practically, the research's implications emphasize the need for managers to integrate technology investments with human resource training programs, visionary leadership, and robust digital infrastructure. Furthermore, governments need to provide incentive policies and national roadmaps that encourage inclusive AI adoption (AP News, 2024; Reuters, 2025).

Thus, this study makes important contributions in bridging global literature with Southeast Asian contexts, highlighting how AI serves as a catalyst for business transformation while emphasizing moderating factors' roles in ensuring successful implementation.

CONCLUSION

This study demonstrates that Artificial Intelligence (AI) adoption significantly enhances business performance in Southeast Asia by improving operational efficiency, decision-making quality, customer engagement, and product innovation. However, the positive impact is uneven, with benefits concentrated in firms that possess strong organizational readiness, mature digital infrastructure, and adequate human resource capabilities. Theoretically, these findings reinforce the Resource-Based View and Dynamic Capabilities Theory, positioning AI as both a strategic resource and a dynamic capability whose effectiveness is contingent upon institutional and organizational readiness in emerging market contexts.

From a practical standpoint, the study highlights gaps between large corporations and SMEs, as well as across countries, in reaping AI benefits. To address these disparities, policy measures such as SME-focused AI incentives, regional digital skills training, and cross-border infrastructure collaboration are essential. For business leaders, successful AI adoption requires aligning technological investments with organizational change, leadership transformation, and workforce development. Future research should explore longitudinal and sector-specific dynamics to provide deeper insights into how AI can serve as a catalyst for competitiveness and sustainable economic growth in Southeast Asia.

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