DETERMINANTS OF AI AND MACHINE LEARNING TECHNOLOGY ACCEPTANCE IN BUSINESS DECISION-MAKING AMONG THAI SMES: EVIDENCE FROM CHACHOENGSAO PROVINCE

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ABSTRACT
This research examines factors affecting the acceptance of artificial intelligence (AI) and machine learning (ML) technologies in business decision-making among small and medium enterprises (SMEs) in Thailand. Using quantitative methodology, data were collected from 367 SMEs in Chachoengsao Province through structured questionnaires. The study employed multiple regression analysis to identify key determinants of technology acceptance. The findings reveal that only 24.8% of SMEs currently utilize AI/ML technologies, with AI chatbots being the most popular application. The regression model ($R^2 = 0.742$) demonstrates that perceived usefulness emerges as the strongest positive predictor ($\beta = 0.242$), while security concerns represent the most significant negative factor ($\beta = -0.218$). Other influential factors include top management support ($\beta = 0.207$), technology knowledge and skills ($\beta = 0.189$), and perceived ease of use ($\beta = 0.176$). Significant differences were observed across business characteristics, with medium enterprises showing higher acceptance rates than micro and small enterprises. Service businesses demonstrated the highest technology acceptance compared to manufacturing, trade, and agriculture sectors. The main barriers identified include lack of knowledge and skills (73.6%), budget constraints (68.4%), and data security concerns (61.2%). The study contributes to understanding AI/ML adoption patterns among Thai SMEs and provides insights for developing effective policies and strategies to promote technology acceptance in business decision-making processes within the SME sector.
Keywords: Artificial Intelligence, Machine Learning, Technology Acceptance, Small and Medium Enterprises, Business Decision-Making, Thailand

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INTRODUCTION

In an era of rapid digital transformation, artificial intelligence (AI) and machine learning (ML) technologies have become essential tools for enhancing business decision-making processes, particularly for small and medium enterprises (SMEs), which serve as crucial pillars of the Thai economic system. However, the acceptance and adoption of these technologies in business decision-making among Thai SMEs still varies considerably, resulting from various factors that have not been systematically studied.

Small and medium enterprises in Thailand account for 99.5% of all businesses in the country and serve as major employers, supporting 69.5% of the total workforce. (Office of Small and Medium Enterprises Promotion, 2024). Furthermore, SMEs contribute significantly to the gross domestic product (GDP) at a level of 35.2-35.3% during 2023-2024 (Thaipublica, 2025). These data reflect the strategic importance of SMEs to Thailand's economic and social stability.

The global AI technology market is experiencing exponential growth, with a market value of USD 638.23 billion in 2024, projected to expand to $3,680.47 billion USD by 2034, representing a compound annual growth rate (CAGR) of 19.2% (Precedence Research, 2025). Similarly, the machine learning market was valued at $72.6 billion USD in 2024 and is expected to grow to $419.94 billion USD by 2030, with an average annual growth rate of 33.2% (Grand View Research, 2025).

A Thomson Reuters survey (2024) revealed that 77% of professionals expect AI technology to play a significant role in transforming their work substantially within the next five years, while 78% view AI as a "positive force" that will enhance their profession. Additionally, generative AI has become a major trend in 2024, playing a crucial role in increasing efficiency and promoting innovation across various industries worldwide (AI Magazine, 2025).

Despite the high potential of AI/ML technologies to support business operations, the acceptance of these technologies among Thai SMEs remains at a developmental stage. Recent data from 2025 shows that only 20-21% of SMEs have fully implemented AI technology, while approximately 24% have not adopted AI technology at all (Bangkok Bank, 2025). The Digital Lives Decoded study (2024) revealed that AI usage in SME business contexts remains low compared to other applications.

When compared regionally, Thailand still lags behind neighboring countries such as Malaysia and Singapore, which have AI adoption rates in the business sector of 37-38% (Bangkok Bank, 2025). This gap highlights the necessity of understanding the factors that determine AI/ML technology acceptance among Thai SMEs.

Preliminary studies indicate that the main barriers faced by Thai SMEs are not related to technology access, but rather more complex factors including: lack of appropriate knowledge and skills for effective AI implementation, data security concerns, lack of support from senior management, and organizational resource constraints, as emphasized at the SMEs AI Skills Summit organized by Microsoft in 2025 (Microsoft, 2025).

Understanding these factors is therefore crucial for developing effective strategies to promote AI/ML technology acceptance among Thai SMEs, particularly in business decision-making, which is the core of successful operations.

The application of AI/ML technologies in business decision-making can provide significant benefits to SMEs across multiple dimensions by enabling detailed and rapid analysis of customer data and market information. This results in the ability to develop marketing strategies that target specific audiences, improve customer service quality, and enhance overall operational efficiency (Dr. Tay, 2025).

Concrete application examples include using AI chatbots for 24-hour customer service, utilizing AI for real-time market trend and competitor analysis, and employing machine learning for sales forecasting and inventory management. These applications enable businesses to become more agile and respond to changes more quickly and accurately. Additionally, AI

helps reduce costs and errors from repetitive tasks, resulting in significant increases in profit and business revenue expansion (BS Express, 2025).

Based on the situation and data presented above, this study is critically important and necessary for identifying and analyzing the determinants that affect the acceptance of AI/ML technologies in business decision-making among SMEs in Thailand. Understanding these factors will help SMEs assess their readiness, plan technology implementation effectively, and overcome potential obstacles.

Furthermore, the study results will benefit government agencies in formulating appropriate policies and support measures, technology service providers in developing products and services that meet SME needs, and educational institutions in designing curricula and training programs that align with market demands.

This study will support the development of competitive capabilities among Thai SMEs in the digital era and promote sustainable economic growth in the long term through the effective and appropriate use of AI/ML technologies in business decision-making within the Thai context.

LITERATURE REVIEWS

Technology Acceptance Theory in Individual Dimension

The Technology Acceptance Model (TAM), initiated by Davis et al. in 1989, is considered a fundamental theory for analyzing individual decision-making mechanisms in technology adoption. Its core focuses on the assessment of technology effectiveness (perceived usefulness) and the evaluation of operational complexity levels (perceived ease of use). Both components influence perspectives and motivation for technological innovation application (Huang & Huang, 2017). Subsequently, Venkatesh et al. (2003) developed the unified theory of acceptance and use of technology (UTAUT), which emerged from integrating eight behavioral science theoretical frameworks to create an analytical and predictive tool for new technology adoption behavior. The main structure comprises four key variables: performance expectancy, effort expectancy, social influence, and facilitating conditions, along with moderating variables that play a role in adjusting the strength of relationships, such as gender, age, experience, and voluntariness of use (Marikyan & Papagiannidis, 2025).

Technology Acceptance Theory in Organizational and Social Dimensions

While TAM and UTAUT focus on studying individual behavior, the Diffusion of Innovation theory by Rogers (1995) explains the process by which innovations or new technologies are adopted in society through four main components: innovation, communication channels, time, and social systems. Factors affecting the adoption rate include relative advantage, compatibility, complexity, trialability, and observability (Minishi-Majanja & Kiplang'at, 2005).

For the organizational dimension, the Technology-Organization-Environment (TOE) framework by Tornatzky and Fleischer (1990) divides technology acceptance factors into three main aspects: technological factors (compatibility of new technology with existing systems, ease of use), organizational factors (personnel readiness, organizational confidence), and environmental factors (influence from competitors, industry, and suppliers). This provides a comprehensive perspective for studying technology acceptance at the organizational level (Picoto et al., 2021).

From an experimental study in Vietnamese SMEs by Bruhn et al. (n.d.), it was found that although businesses showed interest in using cloud-based ERP technology to increase efficiency and reduce operational time, they still faced two main obstacles: insufficient digital skills within the organization and economic burden. Key supporting factors included supportive leadership and a strong information technology expert team.

AI/ML Technologies in Business Decision Making

Artificial Intelligence (AI) refers to the development of computer systems capable of mimicking human thinking processes, decision-making, and problem-solving by using technologies such as Machine Learning (ML), Natural Language Processing (NLP), and Computer Vision to analyze massive amounts of data and support business decision-making (IBM, n.d.).

Machine Learning (ML) is a branch of AI that focuses on learning from data to discover patterns, predict, or classify information without explicitly programming defined rules. ML enables businesses to forecast trends, analyze customer needs, and continuously improve work processes (Senna Labs, n.d.).

The main benefits of AI/ML in business include: rapid and accurate processing of large and complex data, better and faster decision-making from deep insights, automation that reduces errors and costs, creating personalized customer experiences such as product recommendation systems and chatbots, and risk analysis and prevention such as financial fraud detection (TechSauce, n.d.).

Related research examples include a study by Thammasat University examining factors affecting AI/ML technology acceptance in the leasing industry, which found that AI/ML helps drive organizations, increase efficiency, and better respond to customer needs (Buntamhnun, 2019).

AI/ML Technology Acceptance in Developing Countries: Recent Evidence and Contextual Factors

The adoption of artificial intelligence (AI) and machine learning (ML) technologies in small and medium enterprises (SMEs) within developing countries has garnered increasing attention, with recent research revealing both significant opportunities and persistent challenges. Studies conducted in Nigeria demonstrate that AI/ML substantially enhance operational efficiency through applications such as inventory management, customer service systems, and online booking platforms, resulting in significant improvements in sales performance and customer responsiveness, though implementation remains constrained by data privacy concerns, regulatory uncertainties, and financial limitations (Ndubuisi-Okolo et al., 2025). Similarly, research across Southeast Asian markets including Malaysia, Singapore, and Indonesia shows that AI applications such as inventory tracking systems, chatbots, and transportation route planning software enable better stock management and customer response capabilities, despite barriers related to workforce readiness and system integration challenges (Chua, 2025). Advanced statistical analysis using SEM-ANN methodology provides robust evidence that AI technologies significantly influence sustainable performance outcomes, contributing to improved decision-making accuracy, cost reduction, increased productivity, and innovation capabilities (Soomro et al., 2025). However, SMEs in developing countries continue to face substantial implementation barriers including financial constraints, shortage of skilled personnel, concerns about job displacement, and regulatory uncertainty regarding data protection requirements (Adu-Ansere & Lumorvie, 2025; Bindah et al., 2025). These findings highlight the complex landscape for AI/ML adoption in developing economies, where while technologies offer substantial benefits, successful implementation requires comprehensive approaches that simultaneously address technological, organizational, financial, and regulatory factors unique to resource-constrained environments.

Small and Medium Enterprises (SMEs) and Technology Acceptance

Dechkajorn and Boonsom (2022) studied technology and innovation acceptance among SMEs in Chonburi Province. This research examined factors influencing technology and innovation acceptance among SME entrepreneurs using a questionnaire with 400 respondents. The research findings revealed that technological, organizational, environmental factors, and innovation characteristics significantly influenced SME technology and innovation acceptance.

Recommendations included promoting and supporting the implementation of technology and innovation in SMEs to enhance potential and competitive capabilities.
Faiz et al. (2024) conducted research studying factors affecting digital technology acceptance in SMEs. This research used the Technology-Organization-Environment (TOE) framework and Diffusion of Innovation (DOI) theory to study factors affecting digital technology acceptance in SMEs. The findings showed that organizational factors had more influence on digital technology adoption in SME businesses than technological and environmental factors.

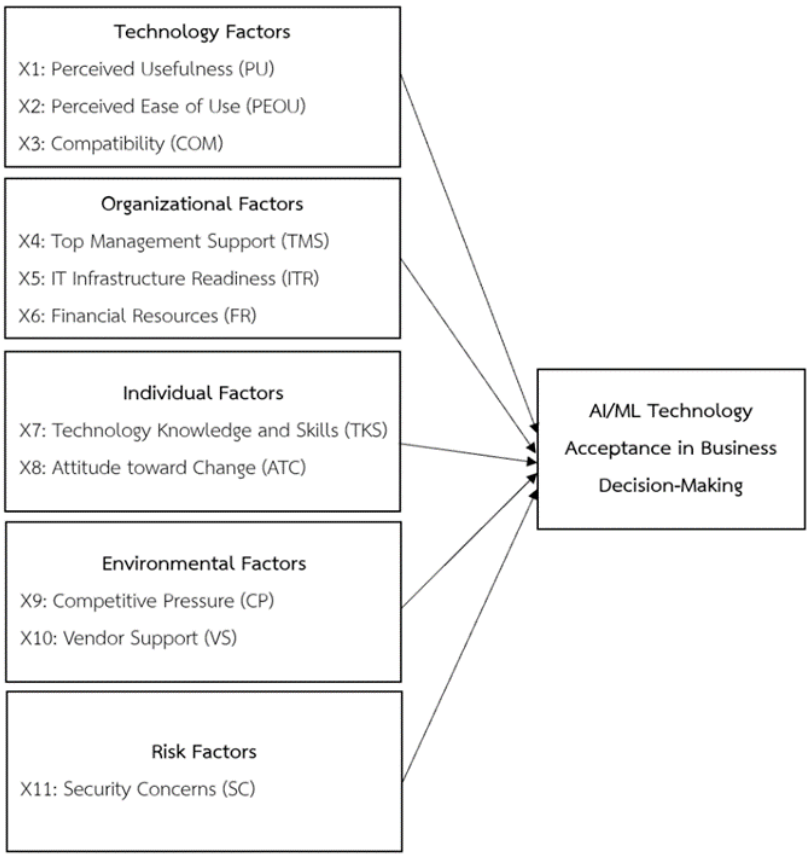

Figure 1 Conceptual Framework

RESEARCH METHODOLOGY

This research employed quantitative research methodology. The population consists of Small and Medium Enterprises (SMEs) in Thailand. In 2024, there were 3,114,743 SMEs, categorized as follows: 2,739,530 micro enterprises, 439,058 small enterprises, and 47,155 medium enterprises. This data is derived from the MSME Outlook Q2/2024 report by the Thai Chamber of Commerce and the Board of Trade of Thailand, which indicates that SMEs account for 99.5% of all enterprises in the country (Office of Small and Medium Enterprises Promotion, 2024). Specifically, Small and Medium Enterprises (SMEs) in Chachoengsao Province numbered 4,422 as of January 2024 (Bureau of Trade Policy and Strategy and Regional Commerce Administration Division, 2024).
The sample group for this research consists of Small and Medium Enterprises (SMEs) in Chachoengsao Province. The sample size was determined using Yamane's formula (1967) at a 95% confidence level ($\alpha = 0.05$), resulting in 367 respondents.
The research instrument used was a questionnaire examining factors affecting the acceptance of artificial intelligence and machine learning technologies in business decision-making among small and medium enterprises. The Content Validity Index (CVI) ranged from .67 to 1.00, indicating that all questionnaire items were acceptable for use.

Reliability testing was conducted with 30 respondents using Cronbach's alpha coefficient method (Cronbach, 1951), yielding a reliability coefficient of .92 (Butts & Michels, 2006).
The statistical methods used for data analysis included: T-test statistics, One-Way Analysis of Variance (F-test/One-Way ANOVA), and Multiple Regression Analysis.

RESEARCH RESULTS

Factors Affecting AI/ML Technology Acceptance and Usage in Business Decision-Making among Small and Medium Enterprises in Thailand

The research findings reveal comprehensive insights into the factors affecting AI/ML technology acceptance among Small and Medium Enterprises in Thailand. The study involved a total sample of 367 respondents, representing a diverse cross-section of SMEs across various sectors and characteristics.

Demographic Profile of Respondents

The demographic analysis of the sample group shows a male-dominated representation with 229 male respondents (62.4%) compared to 138 female respondents (37.6%). The age distribution indicates that most respondents fall within the productive working age, with the largest group being 36-45 years old (151 respondents, 41.1%), followed by the 25-35 years age group (127 respondents, 34.6%). The 46-55 years group comprised 69 respondents (18.8%), while those over 55 years represented the smallest segment with 20 respondents (5.5%).

In terms of educational background, the findings demonstrate a highly educated sample, with the majority holding bachelor's degrees (214 respondents, 58.3%). A significant portion also possessed master's degrees (105 respondents, 28.6%), while those with education below bachelor's level represented 48 respondents (13.1%). This educational profile suggests a relatively sophisticated business community capable of understanding and implementing advanced technologies.

The business characteristics reveal that micro enterprises with 1-9 employees constituted the largest segment with 168 respondents (45.8%), followed by small enterprises with 10-50 employees (142 respondents, 38.7%), and medium enterprises with 51-200 employees (57 respondents, 15.5%). This distribution aligns with the typical SME landscape where micro enterprises predominate.

Regarding business types, retail and wholesale trade emerged as the most prevalent sector with 119 respondents (32.4%), followed by manufacturing (98 respondents, 26.7%), services (90 respondents, 24.5%), and agriculture (60 respondents, 16.4%). The business age distribution shows a relatively mature business environment, with enterprises operating for 5-10 years representing the largest group (131 respondents, 35.7%), those operating for more than 10 years (130 respondents, 35.4%), and newer businesses with less than 5 years of operation (106 respondents, 28.9%).

Current Status of AI/ML Technology Adoption

The assessment of AI/ML technology familiarity reveals moderate awareness levels among SMEs, with an average score of 3.42 out of 5. The distribution shows that many respondents have moderate familiarity (168 respondents, 45.8%), while 108 respondents (29.4%) report slightly familiarity. Only 68 respondents (18.5%) claim to be very familiar with AI/ML technologies, and 23 respondents (6.3%) report no familiarity at all.

Regarding actual usage, the findings indicate that 91 respondents (24.8%) are currently utilizing AI/ML technologies in their business operations. Among these users, AI Chatbots for customer service represent the most popular application, used by 39 respondents (42.9% of users). Product recommendation systems are employed by 29 respondents (31.9% of users), sales data analysis by 26 respondents (28.6% of users), and inventory management systems by 18 respondents (19.8% of users). Importantly, 141 respondents (38.4%) are currently

considering AI/ML adoption, while 135 respondents (36.8%) express no interest in these technologies.

Analysis of Determining Factors

1) Technology Factors: X1: Perceived Usefulness (PU) ($\overline{X}$ = 4.15, S.D. = 0.72) X2: Perceived Ease of Use (PEOU) ($\overline{X}$ = 3.68, S.D. = 0.84) X3: Compatibility (COM) ($\overline{X}$ = 3.72, S.D. = 0.89) 2) Organizational Factors X4: Top Management Support (TMS) ($\overline{X}$ = 3.94, S.D. = 0.91) X5: IT Infrastructure Readiness (ITR) ($\overline{X}$ = 3.51, S.D. = 0.97) X6: Financial Resources (FR) ($\overline{X}$ = 3.29, S.D. = 1.08) 3) Individual Factors X7: Technology Knowledge and Skills (TKS) ($\overline{X}$ = 3.38, S.D. = 1.02) X8: Attitude toward Change (ATC) ($\overline{X}$ = 3.76, S.D. = 0.88) 4) Environmental Factors X9: Competitive Pressure (CP) ($\overline{X}$ = 3.89, S.D. = 0.81) X10: Vendor Support (VS) ($\overline{X}$ = 3.63, S.D. = 0.93) 5) Risk Factors X11: Security Concerns (SC) ($\overline{X}$ = 3.84, S.D. = 0.79)

Significant Differences and Patterns

The hypothesis testing reveals significant differences across various business characteristics. Business size demonstrates a strong significant difference ($F = 8.45$, $p < 0.001$), with medium enterprises showing the highest acceptance levels (4.15), followed by small enterprises (3.78) and micro enterprises (3.42). This pattern suggests that larger SMEs have greater resources and capabilities to adopt advanced technologies.

Educational level also shows significant differences ($F = 6.23$, $p < 0.01$), with entrepreneurs holding master's degrees demonstrating higher acceptance (4.02) compared to those with bachelor's degrees (3.71) and below bachelor's level education (3.38). This finding underscores the importance of education in technology adoption decisions.

Business type differences are also statistically significant ($F = 4.87$, $p < 0.01$), with service businesses showing the highest acceptance (3.95), followed by manufacturing (3.78), trade (3.64), and agriculture (3.42). This variation likely reflects the different technological requirements and digital maturity levels across sectors.

Predictive Model and Key Determinants

The multiple regression analysis produced a comprehensive predictive equation for AI/ML technology acceptance: AI/ML Technology Acceptance = 0.89 + 0.24(PU) + 0.18(PEOU) + 0.15(COM) + 0.21(TMS) + 0.16(ITR) + 0.12(FR) + 0.19(TKS) + 0.14(ATC) + 0.17(CP) + 0.13(VS) - 0.22(SC).

This model reveals that Perceived Usefulness (0.24) and Top Management Support (0.21) are the strongest positive predictors, while Security Concerns (-0.22) represent the most significant negative influence on technology acceptance. The model demonstrates that successful AI/ML adoption requires a combination of technological, organizational, individual, and environmental factors, with particular attention to addressing security concerns that may inhibit adoption.

Table 1 Regression Analysis of Factors Affecting the Acceptance and Usage of AI/ML Technologies in Business Decision-Making of Small and Medium Enterprises

Factors	Beta	t-value	p-value	Priority Ranking
X1: Perceived Usefulness (PU)	0.242	7.85	<0.001	1
X11: Security Concerns (SC)	-0.218	-6.94	<0.001	2
X4: Top Management Support (TMS)	0.207	6.52	<0.001	3
X7: Technology Knowledge and Skills (TKS)	0.189	5.78	<0.001	4
X2: Perceived Ease of Use (PEOU)	0.176	5.43	<0.001	5
X9: Competitive Pressure (CP)	0.168	5.12	<0.001	6
X5: IT Infrastructure Readiness (ITR)	0.155	4.67	<0.001	7
X3: Compatibility (COM)	0.149	4.34	<0.001	8
X8: Attitude toward Change (ATC)	0.138	4.01	<0.001	9

Factors	Beta	t-value	p-value	Priority Ranking
X10: Vendor Support (VS)	0.127	3.78	<0.001	10
X6: Financial Resources (FR)	0.115	3.78	<0.01	11
($R^2 = 0.742$, $F = 47.23$, $p < 0.001$)				

Key Findings from Statistical Analysis

The analysis results demonstrate that **Perceived Usefulness (PU)** has the highest influence on AI/ML technology acceptance, while **Security Concerns (SC)** represents the second most influential negative factor affecting adoption.

Barriers to Technology Adoption

The main barriers include: 1) Lack of knowledge and skills (270 respondents, 73.6%)-absence of personnel with expertise, uncertainty about implementation methods; 2) Budget constraints (251 respondents, 68.4%)-high initial investment costs, uncertainty about return on investment; 3) Data security concerns (225 respondents, 61.2%)-fear of customer data breaches, lack of confidence in security systems; 4) Lack of management support (201 respondents, 54.7%)-management does not recognize importance, no budget allocation; 5) Technology complexity (179 respondents, 48.9%)-difficult to understand, requires work process modifications.

Factors Promoting Acceptance

Success examples in the same industry (288 respondents, 78.5%); Training and personnel skill development (273 respondents, 74.3%); Government financial support (256 respondents, 69.7%); Expert consultation (243 respondents, 66.2%); User-friendly AI/ML systems (234 respondents, 63.8%).

Expected Benefits from AI/ML Usage

Increased work efficiency (302 respondents, 82.3%); Faster and more accurate decision-making (282 respondents, 76.8%); Reduced operating costs (262 respondents, 71.4%); Increased customer satisfaction (253 respondents, 68.9%); Creating competitive advantage (241 respondents, 65.7%).

DISCUSSION & CONCLUSION

The research findings reveal that Perceived Usefulness (PU) emerges as the most influential factor affecting AI/ML technology acceptance in business decision-making among SMEs (Beta = 0.242, $p < 0.001$). This result aligns with Davis's (1989) Technology Acceptance Model (TAM) and Huang & Huang's (2017) research, which found that perceived technology benefits serve as the primary factor in acceptance decisions. This study confirms that Thai SMEs demonstrate rational decision-making in technology investments, primarily considering the benefits they will receive.

An interesting finding is that Security Concerns (SC) emerges as the second most influential negative factor (Beta = -0.218, $p < 0.001$), reflecting Thai SMEs' significant apprehensions about data security. This aligns with survey results showing that 61.2% of respondents worry about customer data breaches. These concerns reflect a lack of confidence in AI/ML security systems and uncertainty regarding personal data protection laws.

Top Management Support (TMS) ranks third in influence (Beta = 0.207, $p < 0.001$), consistent with the study by Bruhn et al. emphasizing the importance of supportive leadership in technology implementation and aligning with Dechkajorn and Boonsom's (2022) research finding that organizational factors significantly influence technology acceptance.

Technology Knowledge and Skills (TKS) ranks fourth in influence (Beta = 0.189, $p < 0.001$), corresponding to the main barrier identified in the study: lack of knowledge and skills (73.6%). This result aligns with Microsoft's (2025) study emphasizing the importance of AI skill development in SMEs.

Regarding business characteristic differences, the study finds significant variations by business size, with medium enterprises showing higher acceptance than small and micro enterprises. This reflects the relationship between organizational size and resource and infrastructure readiness. Service businesses showing the highest acceptance may be due to their nature requiring customer experience improvements and service efficiency enhancement.

The main barriers identified include lack of knowledge and skills (73.6%) and budget constraints (68.4%), consistent with Faiz et al.'s (2024) finding that organizational factors have more influence than technological factors. This indicates that problems do not lie in technology access but in organizational capability development challenges.

SMEs expect increased work efficiency (82.3%) and faster, more accurate decision-making (76.8%), aligning with AI/ML technology potential identified in Dr. Tay's (2025) and BS Express's (2025) research. These expectations reflect Thai SMEs' understanding of technology benefits but indicate their need for implementation support.

This study identifies key factors affecting AI/ML technology acceptance in business decision-making among SMEs in Chachoengsao Province. Research results show that facilitating factors include technology benefit perception, top management support, technology knowledge and skills, and perceived ease of use. Barrier factors, particularly data security concerns, lack of knowledge and skills, and financial resource constraints, were identified. Business characteristic differences reveal that larger enterprises and service businesses tend to have higher acceptance rates. Current usage status shows only 24.8% of SMEs have begun using AI/ML, which remains lower than neighboring countries' averages.

Recommendations

1) Policy and Practice Implications

The research findings provide significant implications for policy formulation and practical implementation strategies to promote AI/ML technology adoption among Thai SMEs. The identified barriers and facilitators require coordinated interventions across multiple stakeholders to address the complex challenges facing SME digital transformation.

2) For Government Agencies

Government agencies should establish comprehensive AI/ML training programs to address the critical skills gap affecting 73.6% of SMEs. This involves creating regional excellence centers offering sector-specific certification programs. Training curricula should include basic awareness for management teams, intermediate application skills for operational staff, and advanced implementation capabilities for IT personnel.

Financial support mechanisms must extend beyond traditional loan programs. AI/ML adoption voucher systems should provide SMEs with credits ranging from 50,000 to 500,000 baht for approved solutions. Risk-sharing mechanisms through public-private partnerships can encourage financial institutions to offer specialized AI/ML investment loans with preferential interest rates. Performance-based incentive programs can provide tax benefits upon achieving measurable productivity improvements.

Given that security concerns represent the second most significant barrier, developing robust yet accessible cybersecurity infrastructure is crucial. The government should establish SME-specific data protection guidelines that simplify PDPA compliance while maintaining security standards.

3) For SMEs Entrepreneurs

SME entrepreneurs should adopt systematic phased implementation beginning with low-risk, high-impact applications such as AI chatbots for customer service. They should then progress to inventory management systems and advance to predictive analytics as organizational capabilities develop. Each phase should include comprehensive change management strategies addressing employee concerns.

Executive leadership development focusing on AI/ML strategic implications rather than technical details is essential. Entrepreneurs should establish AI/ML steering committees comprising representatives from different business functions. These committees should develop clear implementation roadmaps, success metrics, and risk mitigation strategies aligned with overall business objectives.

Addressing the skills gap requires strategic human resource investments. This includes partnerships with local technical colleges for internship programs and cross-training initiatives where employees learn both traditional processes and AI/ML applications.

4) For Technology Providers

Technology providers must address complexity barriers by developing solutions specifically designed for SME constraints. This includes modular AI/ML platforms allowing basic functionality implementation with scaling capabilities as needs grow. Solutions should feature intuitive interfaces requiring minimal technical expertise and comprehensive documentation in local languages.

Comprehensive support ecosystems should include business process consulting services. These services help entrepreneurs understand how AI/ML addresses specific operational challenges rather than focusing solely on technical support. Establishing SME-focused support teams trained in business analysis and change management ensures technical solutions align with business objectives.

Addressing security concerns requires transparent security measures through regular third-party audits and clear data handling documentation. Providers should offer trial periods allowing SMEs to test systems without significant upfront investments.

5) Coordinated Implementation Strategy

The interconnected nature of identified barriers requires coordinated solutions involving government agencies, technology providers, educational institutions, and industry associations. Establishing formal collaboration mechanisms such as AI/ML promotion committees with representatives from all stakeholder groups ensures aligned efforts and resource optimization.

Comprehensive monitoring systems should track adoption rates, success factors, and barrier resolution progress. The government should publish annual AI/ML adoption reports comparing regional progress and identifying best practices to accelerate digital transformation.

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