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The Determinants of AI Marketing Tools Adoption among SMEs in Malaysia

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Abstract

The rapid advancement of Artificial Intelligence (AI) presents significant opportunities for Small and Medium-sized Enterprises (SMEs), particularly in marketing. Despite its potential, AI adoption among SMEs remains limited, especially in developing countries like Malaysia. This conceptual paper examines the key factors influencing the adoption of AI marketing tools among SMEs, focusing on three critical constructs: relative advantage, compatibility, top management support and perceived usefulness as mediators. This paper explores how these factors shape SMEs' intentions and readiness to adopt AI tools. The discussion highlights the necessity of aligning AI tools with business requirements, confirming perceived advantages, and minimizing obstacles to adoption. Understanding these elements is vital for facilitating successful AI deployment among SMEs. The expected findings will offer valuable insights into adopting AI marketing tools, particularly related to technology and organization, for SME stakeholders by aiding in formulating tailored support systems and strategic concepts. Ultimately, this study seeks to deepen understanding of digital transformation and encourage enhanced AI adoption within Malaysia's SME sector.

Keywords: Relative Advantage, Compatibility, Top Management Support, Small and Medium-Sized Enterprises (SMEs), Adoption of AI, Perceived Usefulness

Introduction

The rapid development of technology has led to the Fourth Industrial Revolution (IR4.0), where artificial intelligence (AI), the Internet of Things (IoT), big data, and blockchain are transforming business operations across various sectors (Manda & Dhaou, 2019). AI has become a crucial force for innovation and competitiveness, making its adoption essential for a company's long-term survival (Ali et al, 2024).

In Malaysia, the government through the Twelfth Malaysia Plan (2021–2025), is actively promoting digital adoption especially among Small and Medium-sized Enterprises

(SMEs) in key industries such as manufacturing, services, and construction (SME Corp, 2021). As the backbone of the Malaysian economy, SMEs are vital for innovation, employment, and the nation's competitiveness. However, many SMEs encounter significant barriers, including costs, lack of awareness, and limited digital readiness, which hinder their ability to adopt AI tools effectively (Sánchez et al, 2025; Sharma et al., 2023; Gupta et al., 2022).

Despite the increasing availability of AI tools that can boost efficiency and marketing capabilities, adoption among Malaysian SMEs remains inconsistent and limited (Lada et al., 2023). Many SME owners remain unaware of the government support available to adopt AI, and nearly 34% perceive AI-related solutions as too costly (SME Corp, 2021). Additionally, compatibility issues such as outdated systems or misalignment with existing business processes increase the reluctance to adopt AI, particularly among traditional or rural-based enterprises (Kant & Johannsen, 2022; Subocz, 2021).

Nevertheless, AI marketing tools offer substantial potential for SMEs, facilitating data-driven decision-making, personalised customer engagement, and enhanced operational efficiency (Sohrabpour et al., 2021). When implemented effectively, AI can be transformative for SMEs, enabling them to scale rapidly and stay competitive in the digital marketplace. However, there is a notable gap in the academic literature and most research on AI adoption concentrates on large enterprises, neglecting the specific needs and limitations of SMEs, especially within the Malaysian context (Badghish et al., 2024).

This study seeks to address this gap by examining the key factors that impact SMES in Malaysia adopting AI marketing tools. These include perceived relative advantage, compatibility, top management support, and perceived usefulness. Understanding these drivers and barriers is essential for SME owners, policymakers, digital solution providers, and researchers. The research supports the national digital transformation agenda by highlighting SMEs' opportunities and challenges while promoting broader economic growth. Ultimately, the goal is to help SMEs make better technology choices, speed up AI adoption, and enhance Malaysia's position as a digitally advanced country.

Literature Review

Small Medium Enterprise (SMEs) in Malaysia

Small and medium enterprises (SMEs) serve as the backbone of global economies by driving innovation, economic growth, and job creation (World Bank, 2020). Recently, SMEs have increasingly ventured into various business markets, looking for growth and expansion opportunities (Mogaji, Soetan, & Kieu, 2020). As the Fourth Industrial Revolution progresses and the digitalization race continues, SMEs are under growing pressure to adopt digital technologies, particularly Artificial Intelligence (AI), to stay competitive (Ghobakhloo & Iranmanesh, 2021; Maroufkhani et al., 2022). However, many SMEs find it challenging to adopt innovative technologies effectively due to limited resources, both financial and non-monetary, which hinder their progress.

In the current era of digital transformation, small and medium-sized enterprises (SMEs) are keen to embrace cutting-edge technologies that accelerate their growth and strengthen their competitive position (Maroufkhani et al., 2022). AI-powered solutions, such as accounting automation and machine learning, offer significant chances for SMEs to improve their

operations within the context of Industry 4.0 (Jagatheesaperumal et al., 2021; Surianti, 2020). These technologies not only enhance operational efficiency but also improve decision-making and boost customer engagement, making them attractive choices for progressive SMEs.

The Malaysian government recognizes the strategic importance of adopting AI and has prioritized improving AI capabilities in SMEs, which play a significant role in the nation's GDP (SME Corp and Wei, 2018). This initiative aligns with national goals aimed at enhancing innovation and productivity through AI integration. However, despite these commendable efforts, it is essential to conduct a comprehensive evaluation to assess their effectiveness in fostering widespread AI adoption among SMEs, as well as to identify any gaps or areas for improvement.

Relative Advantage

Relative advantage refers to how much a new technology or innovation is viewed as better than the previous technology or processes it replaces, which notably affects adoption choices (Rogers, 2003; Rogers & Williams, 1983). When it comes to adopting AI, relative advantage is crucial since organizations tend to embrace innovations they see as advantageous for their performance (Baker, 2012; Nimfa et al., 2021; Shahzad et al., 2023). AI technologies provide numerous benefits, including increased efficiency, improved service delivery, reduced costs, quicker decision-making, enhanced forecasting, and the capability to target new customer segments (Press, 2016; Mikalef et al., 2021; Shahzad et al., 2023).

These benefits are especially important for SMEs in competitive landscapes, where utilising technology can generate strategic advantages. Previous research has consistently demonstrated a positive correlation between relative advantage and innovation adoption (Alsheibani et al., 2020; Ramdani et al., 2020; Grandon, 2004). Additional studies suggest that a stronger perceived advantage leads to a faster adoption rate (Lin et al., 2011), as businesses are more inclined to adopt technologies they believe will enhance their performance and confer a competitive advantage (Ezzaouia et al., 2020; R. Pillai et al., 2020; H. Chen, 2021; A. Huang et al., 2021). Thus, the perceived relative advantages offered by AI marketing tools significantly impact SMEs' decisions to adopt these technologies, as they provide considerable operational and strategic benefits that promote business growth and competitiveness.

Compatibility

Compatibility involves how well an innovation fits with established values, experiences, and operational requirements (Rogers, 2003). It significantly influences technology adoption, as organisations tend to embrace innovations that align with their current processes and culture (Ahmi et al., 2014; Chatterjee et al., 2021). Numerous studies highlight compatibility as a crucial factor in adoption, affecting perceived usefulness (PU) and perceived ease of use (PEU) (Bhattacherjee & Lin, 2015; Gangwar et al., 2015; Katebi et al., 2022). In Rogers' (2003) Diffusion of Innovations (DOI) framework, compatibility encourages the adoption of innovations by minimising perceived disruption. For SMEs, compatibility with current IT infrastructure and workflows improves readiness to adopt AI, thereby reducing integration costs and mitigating resistance (Azmi et al., 2016; Marzouki et al., 2023).

The adoption of AI is influenced by how well it integrates with a firm's systems, values, and strategies. When technologies like robotic process automation (RPA) are compatible with

current network architecture and business models, their implementation becomes more effective (Willcocks et al., 2017). High compatibility lowers resistance, allows for smooth integration, and boosts innovation performance (Alsetoohy et al., 2021). On the other hand, a lack of compatibility with human decision-making or IT systems can create challenges in implementation (Wu et al., 2007). Research shows a strong positive correlation between compatibility and the adoption of AI, big data analytics, and mobile payment systems among SMEs (Khan et al., 2023; Maroufkhani et al., 2021). Aligning new technologies with existing capabilities and strategies is crucial for their successful and sustainable adoption.

Top Management Support

Top management plays a pivotal role in driving the adoption of AI-powered marketing tools, particularly within SMEs. Their support is essential for setting a clear vision, allocating resources, and encouraging innovation in digital marketing efforts (Chong & Chan, 2012; Sony & Naik, 2019). AI tools such as chatbots, customer segmentation platforms, recommendation systems, and automated content generation rely heavily on strategic leadership for successful implementation. When top managers hesitate or lack awareness of AI's potential in enhancing marketing effectiveness, it often leads to organizational inertia and delayed adoption. Moreover, the leadership's involvement is crucial in overcoming challenges related to data readiness, financial constraints, and technology infrastructure (Baig, 2019; Shahzad et al., 2023). By promoting AI as a strategic priority, top executives can foster a culture of innovation and encourage marketing teams to embrace data-driven tools and practices.

In addition, effective adoption of AI marketing tools requires top managers to facilitate collaboration across departments, support employee upskilling, and drive a unified approach to digital transformation (Hsu et al., 2019; Sun et al., 2020). Their leadership ensures that marketing functions are empowered with advanced capabilities such as personalized targeting, predictive analytics, dynamic pricing, and real-time customer engagement (Cabrera-Sánchez et al., 2020; Cao et al., 2021). However, studies show that many SME leaders face barriers including limited funding, lack of technical expertise, and unawareness of AI's marketing benefits (Ingalagi et al., 2021; Davenport, 2018). As the digital economy evolves, it becomes increasingly essential for top managers to act as change agents, driving the strategic integration of AI into marketing processes and ensuring long-term competitiveness (Sharma et al., 2022; Tawfik et al., 2022).

Adoption of AI marketing tools

Artificial Intelligence (AI) is central to the Fourth Industrial Revolution, with global leaders like the U.S., China, Japan, and South Korea investing heavily to enhance automation and industrial processes (Yang et al., 2024; Ahmed et al., 2022). AI technologies such as robotics, natural language processing, and neural networks—are being integrated into key sectors, improving efficiency and decision-making while addressing broader economic and social challenges (Baabdullah et al., 2021; Zhang et al., 2024).

In marketing, AI enables data-driven personalization and automation. Through advanced analytics and machine learning, businesses can gather insights from online platforms to tailor content and increase customer engagement (Haleem et al., 2022; Capatina et al., 2020). For SMEs, AI offers affordable tools to optimize campaigns, segment customers, and enhance competitiveness (Geru et al., 2018). Beyond marketing, AI benefits SMEs by

improving decision-making, productivity, and internal processes (Basri, 2020). It supports customer service automation, cybersecurity, and strategic planning, helping SMEs remain agile despite limited resources (Hamal & Senvar, 2021; Drydakis, 2022).

However, challenges such as high costs, lack of expertise, and cybersecurity concerns hinder AI adoption among SMEs (OECD, 2021; Cubric et al., 2020). Limited awareness and unclear ROI also slow progress, especially in emerging markets (Rawashdeh et al., 2023). Still, cloud computing, open-source tools, and government initiatives are making AI more accessible, paving the way for greater adoption and sustainable growth (Roux et al., 2023; Canhoto & Clear, 2020).

Perceived Usefulness

Perceived usefulness is defined as the extent to which users believe that utilising technology can improve their performance or ease their tasks within an organisation (Rafique et al., 2023). Specifically, regarding AI adoption in SMEs, it reflects the extent to which business owners view AI as beneficial for enhancing operations, decision-making, and overall growth. When SMEs recognise significant value in AI, they are more inclined to adopt it rather than relying on other tools. Conversely, if they doubt that AI effectively aids their business activities, their likelihood of adopting the technology decreases (Rafique et al., 2023; Al-Okaily, 2022; Thottoli et al., 2022). Thus, it is crucial to address concerns related to perceived usefulness to foster AI adoption, especially among SMEs that may feel uncertain or lack confidence in integrating advanced technologies into their operations.

Proposed Conceptual Framework

The conceptual framework shown in Figure 1 builds upon the reviewed literature and evaluates the factors that impact AI adoption in SMEs, particularly highlighting relative advantage, compatibility and top management support. This study includes both dependent and independent variables, where the former influences the latter. Figure 1 depicts the hypotheses established for this research, aligning with the research questions and objectives.

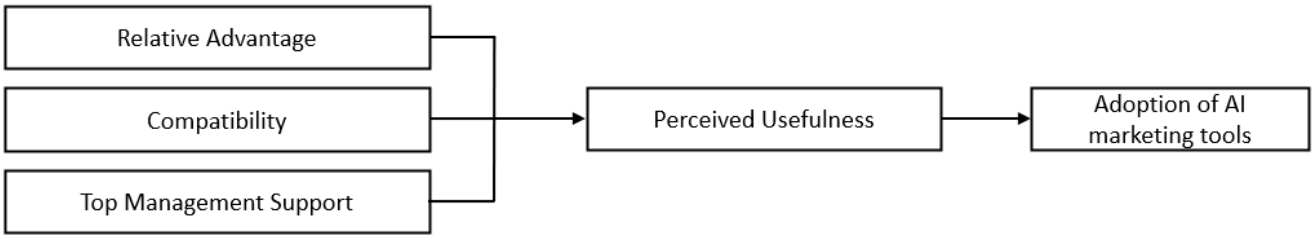

Figure 1: A Proposed Conceptual Framework

Figure 1 outlines the conceptual framework of this study. The independent variables of this study are Relative Advantage, Compatibility and Top Management Support. Adoption of AI marketing tools is the dependent variable and Perceived Usefulness as mediator. The Proposed Conceptual Framework Research hypotheses of the study:

H1: Relative Advantage (RA) has a significant relationship towards adoption of AI marketing tools among SME.

H2: Compatibility (COMP) has a significant relationship towards adoption of AI marketing tools among SME.

H3: Top Management Support (TMS) has a significant relationship towards adoption of AI marketing tools among SME.
H4: Perceived usefulness (PU) has a mediate the relationship between relative advantage and adoption of AI marketing tools among SME.
H5: Perceived usefulness (PU) has a mediate the relationship between compatibility and adoption of AI marketing tools among SME.
H6: Perceived usefulness (PU) has a mediate the relationship between top management support and adoption of AI marketing tools among SME.

Conclusion

In conclusion, using AI presents a strategic opportunity for SMEs to enhance competitiveness, improve decision-making and streamline operations in the increasingly digital economy. This paper highlights the importance of relative advantage, compatibility and perceived usefulness as core factors influencing adoption. SMEs are more likely to adopt AI when they perceive tangible benefits over existing practices, when the technology aligns with their current systems and values, and when it is seen as a tool that will significantly improve business performance.

This conceptual exploration enhances the ongoing discussion about digital transformation in developing economies by providing a theoretical framework for assessing AI readiness among SMEs. It underscores the necessity for improved awareness and supportive government policies to diminish perceived obstacles and enhance the acknowledged benefits of AI technologies. Future studies should build on this model by empirically evaluating these constructs within Malaysian SMEs and incorporating external elements such as government support and organisational readiness, offering a comprehensive perspective on practical AI adoption.

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