

Moving on to Not Fall Behind? Artificial Intelligence (AI) and Small and Medium-Sized Enterprises (SMEs) Performance

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Abstract

Artificial Intelligence (AI) is not just a futuristic dream but a game changer for business. From improving customer experience to streamlining operations and unlocking new growth opportunities, AI is profoundly changing business. By embracing AI, businesses can gain a competitive advantage, improve customer experience, improve decision-making, and drive innovation. This study examines the impact of AI readiness, government support for AI, and business innovation on SME performance. The second is to examine the indirect path of business innovation on the proposed relationship. The study employed a cross-sectional survey of the population of young entrepreneurs in Negeri Sembilan, Malaysia. The sample involves 384 respondents who were purposively selected. The data were analyzed using Structural Equation Modeling (SEM). The findings have discovered that AI readiness, government support, and business innovation influence SME performance. Moreover, business innovation has a strategic impact on the growth and success of the SMEs. It acts as a mediator to strengthen the impact of AI readiness and government support for AI on business performance. This study aims to help SMEs make the most of the potential of AI tools to improve their business strategies and compete in an increasingly challenging digital market. In addition, innovation is the foundation for sustainable growth, intense competitiveness, and adaptation to the inevitable change that needs to be utilized by all entrepreneurs.

1. Introduction

According to SME Corp. Malaysia, small and medium enterprises (SMEs) can be classified into two sectors: manufacturing and services (Yadegaridehkordi et al., 2023). For the manufacturing sector, small business is where the annual sales production is from RM300,000 to less than RM15 million or the number of full-time employees

from 5 people to less than 75 people (Yadegaridehkordi et al., 2023). Medium business refers to those with annual sales from RM15 million to no more than RM50 million or the number of full-time employees from 75 people to no more than 200 people. Next, for services and other sectors, small businesses refer to those with annual sales from RM300,000 to less than RM3 million or the number of full-time employees from 5 people to less than 30 people (Yadegaridehkordi et al., 2023). On the other hand, the medium business refers to those with annual sales from RM3 million to no more than RM20 million or the number of full-time employees from 30 people to no more than 75 people (Yadegaridehkordi et al., 2023). SMEs are a labor-oriented sector. The need for labor directly reduces unemployment and creates job opportunities. SMEs open opportunities for unskilled and semi-skilled workers to earn income (Naradda Gamage et al., 2020). The existence of SMEs can reduce the income gap in the community. SMEs also can strengthen the basic structure of the country's economy. The existence of SMEs is complementary to larger firms and in line with Malaysia's dream of becoming an industrialized nation. SMEs offer consumer goods at lower prices when compared to imported goods. If SMEs can increase production and the public buys from them, the government can reduce its dependence on imported goods while reducing the flow of currency abroad. Suppose SMEs are competitive and can improve the quality of production. In that case, the goods can be exported abroad and improve the national economy while achieving the goal of becoming an industrialized country (Naradda Gamage et al., 2020).

Nowadays, SMEs can be used in Artificial Intelligence (AI) in many areas (Omrani et al., 2022). It is like having a wizard's wand to solve problems and make things great. In Malaysia, the Malaysian Artificial Intelligence Roadmap 2021-2025 (AI-Rmap) and the Malaysian Digital Economy Action Plan (MDEB) reflect the government's vision of integrating AI across sectors, fostering increased productivity, attracting international investment, and bridging the gap with developed countries. From streamlining internal communications to facilitating immediate responses to customer inquiries, AI-powered tools and software present many exciting opportunities. Conversational AI can provide round-the-clock support, ensuring customers receive help when needed, regardless of time zones or public holidays (Baabdullah et al., 2021). This constant availability is essential for businesses with global operations or customers requiring support outside traditional business hours. Failure to implement a considered and responsible use of business AI can cause business disruption (Wei & Pardo, 2022).

AI and machine learning significantly change how companies quickly connect or meet customer needs and are highly productive. AI technology is being adopted in many industries, including health, sales, human resources, operations, factory and production, marketing, and others. There are various AI software in business. AI becomes an important tool or mechanism to help businesses run smoothly and increase productivity. AI can recommend the products we want to find based on our past purchase and request history (Lu et al., 2022). AI can determine what kind of content we want to see, and AI is used to execute business processes automatically. More and more consumers are buying online. They do not need to contact the company representative to get the necessary items. AI can simplify the buying process, from chatbots to various programs. One of the primary uses of AI right now is analyzing business data (Baabdullah et al., 2021). Businesses can use AI to analyze data according to the recommendations or conclusions (Sharma et al., 2022).

One of the main points of the lack of AI adoption is the lack of supervision and regulation, leaving many people second-guessing their job security (Galaz et al., 2021). Another concern related to open-source generative AI is a security risk that can leave sensitive customer data vulnerable to exploitation. Although AI tools can benefit digital marketing, sometimes the answers provided may need to be more accurate based on complete data. For example, if an AI-powered algorithm is trained with biased data, it may retain or reinforce that bias in its results. This may result in discrimination or exclusion of specific customer groups if the entrepreneurs use AI tools for market research (Baabdullah et al., 2021). People will also become more dependent on AI tools. While AI can automate many tasks and provide instant analysis, it cannot replace human workers' creativity, empathy, and critical thinking skills (Sharma et al., 2022). An over-reliance on AI can also result in a uniform marketing approach, as it is highly likely that the business will rely on the same data and insights as the competitors (Lu et al., 2022). Thus, this study examines the influence of AI readiness, government support towards AI, and business innovation on young SMEs' performance. Moreover, the second objective is to examine the mediation influence of business innovation on the relationship between AI readiness, government support for AI, and young SMEs' performance. This study can be used to design entrepreneurial programs and activities to improve the business performance of young entrepreneurs. These results are expected to be widely utilized by policymakers and practitioners to promote AI adoption in SMEs. This significant study could help the government develop young entrepreneurs' AI readiness. Young entrepreneurs are identified as agents of change in the world economy, which can be seen today through their success in entrepreneurship and business. The Malaysian government focuses on developing and producing more successful young entrepreneurs in the SME business field. Young entrepreneurs have a high desire, motivation, strength, and energy to carry out entrepreneurial activities. The potential of youth in entrepreneurship and business needs to be polished early, improved, and continued to succeed in the field. In Malaysia, today's youth have been exposed to various entrepreneurship-related knowledge and skills. The involvement of young people in the SME sector is considered vital as it contributes significantly to the country's

income. Successful entrepreneurs not only create new businesses but also increase employment opportunities that lead to the creation of the latest discoveries, such as new technologies and innovations (Hassan et al., 2020).

2. Literature Review

Careers in entrepreneurship are increasing and becoming one of the main factors contributing to the growth and development of the country's economy. This sector has become a career choice among the younger generation, especially in progressive countries. Likewise, in Malaysia, in the past, the younger generation was less interested in engaging in entrepreneurial careers. However, due to the self-awareness of the younger generation about the benefits and advantages of entrepreneurship, many of them have entered the world of entrepreneurship. Previous studies have proven that the success of entrepreneurs can be identified when entrepreneurs adapt to an external environment, such as technological advancement, and change the current trends (Omrani et al., 2022; Wei & Pardo, 2022).

2.1 Technology–Organization–Environment (TOE) Framework

Technology Organization Environment (TOE) was initially developed by Tornatzky et al. (1990). Technology is related to the external and internal of a company. Technology focuses on organizations' structure, quality, and technological characteristics that can influence innovation adoption. The organization includes attributes from organizations such as structures and mechanisms decisions that can facilitate the adoption of innovations. The environment presents all external factors, such as organizations' competitors, suppliers, government, customers, and a community that can determine the required innovation and the ability to implement the innovation. The TOE framework is compatible with the theoretical concept of innovation in organizations (Nguyen et al., 2022). There are several reasons why the TOE framework was chosen as the theoretical framework to support this research. First, the TOE framework is suitable for studying AI adoption. Second, the TOE framework has a clear theoretical foundation and consistent empirical support. Third, TOE is consistent with IT innovation theory at other organizational levels, reinforcing and enhancing the framework's explanatory power. Fourth, TOE is viewed as a comprehensive framework that can be used to study the adoption of information technology or AI. Fifth, the three contexts (i.e., technology, organization, and environment) offer superiority over other adoption models because the TOE framework provides a comprehensive view of the factors influencing IT adoption decisions (Kumar & Shankar, 2024). AI plays a vital role in the digital transformation of enterprises and is one of the main driving forces that drive the sustainable development of SMEs.

2.2 AI for Business

AI tools offer several benefits for digital marketers, making them a powerful tool for businesses to achieve their marketing goals. One of the main advantages of AI tools is their ability to automate tedious and repetitive tasks, such as data entry, creating marketing calendars for SMEs, and email marketing (Baabdullah et al., 2021). This frees up valuable time for marketing professionals, allowing them to focus more on more strategic and creative tasks requiring creativity and ingenuity. By automating these unproductive tasks, AI tools can help businesses reduce costs, increase productivity, and increase employees' efficiency and technical expertise (Wei & Pardo, 2022). Another benefit of AI tools for digital marketing is their ability to analyze large amounts of data quickly and accurately (Sharma et al., 2022). With machine learning algorithms, AI tools can detect patterns in data that may be difficult for humans to identify, and entrepreneurs will gain valuable insights into customer behavior, preferences, and needs (Bettoni et al., 2021). This allows marketers to create more personalized and targeted customer campaigns, increasing engagement and conversions (Lu et al., 2022). This can lead to higher customer satisfaction and loyalty rates, ultimately increasing sales and profitability for the business.

According to the AI Readiness Index by Oxford Insights, Malaysia ranks 23rd globally and 6th in the region in AI readiness, with a score of 68.71 out of 100. In addition, the Global AI Index by Tortoise Media rates countries based on their AI development, showing that Malaysia ranks 44th in the index (Oxford Insights, 2023). According to this index, Malaysia is at a moderate level, and various initiatives must be implemented to strengthen further the country's AI level (Oxford Insights, 2023). Malaysia performs well in operations and infrastructure but needs improvement in talent, research and development, and commercial aspects of AI. Malaysia also faces several challenges, such as data warehouses, lack of expertise, and ethics, which are constraints to the development of AI. Malaysia needs to leverage AI in various industries, such as manufacturing, healthcare, transportation, and finance, by using the latest AI technologies, such as data analytics, automation—and intelligent technology. AI can significantly impact organizations, the economy, and society in the short and long term (Bettoni et al., 2021).

AI business models are now becoming increasingly important in digital transformation. AI business models can integrate AI technology into their operations to improve organizational performance. In an increasingly complex era with highly competitive competition, local companies must implement AI business models to improve competitiveness (Hansen & Bøgh, 2021). Local companies can improve their competitiveness by leveraging AI's

ability to analyze data quickly, predict market trends, and automate business processes (Sharma et al., 2022). To implement an AI business model, local companies need to focus on several essential aspects of implementing the AI model effectively. AI business models enable local companies to analyze data accurately and effectively. By leveraging machine learning techniques and extensive data analysis, local companies can analyze critical information from various data sources, including customer data and business performance (Hansen & Bøgh, 2021). For example, local companies can use AI to analyze customer transaction data and identify recent purchasing patterns, allowing them to provide products and services tailored to customer needs. With practical data analysis, AI can help local companies predict market trends more accurately (Lu et al., 2022). Local companies can make better business decisions by understanding market trends and demands, including pricing, new product development, and marketing strategies (Bettoni et al., 2021). For example, local companies in the textile and clothing industry can use AI to analyze fashion trend data to predict demand for certain types of clothing, allowing them to provide products more efficiently and reduce waste.

AI allows local companies to tailor their products and services based on customer needs and wants. By analyzing customer data in detail, local companies can learn about their customers' preferences, needs, and purchasing patterns (Hansen & Bøgh, 2021). With this information, they can improve existing products, introduce relevant new products, and improve customer satisfaction. For example, local food and beverage industry companies can use AI to analyze customer feedback data and purchase data to identify customer needs and subsequently introduce new products or menus tailored to customer tastes. AI can help automate business processes, improving a company's operational efficiency (Lu et al., 2022). By automating routine tasks and reducing manual work, local companies can reduce human error, increase productivity, and save costs (Bettoni et al., 2021). For example, local companies in the manufacturing industry can use AI robots to handle the assembly process of components to increase productivity and production. AI enables local companies to provide better customer experience. AI-based customer service, such as chatbots, is an essential technology in the AI era. By using AI, chatbots can provide fast and effective service to customers. Through immediate response, the chatbot provides the necessary information quickly and accurately. Additionally, augmented reality (AR) allows customers to interact with products or services directly through a fun digital experience (Sharma et al., 2022).

2.3 AI Readiness and Business Performance

Entrepreneurs must be prepared to face various technological changes, including using robotics in business management and operations (Baabdullah et al., 2021). AI in e-commerce plays a crucial role in driving innovative solutions and personalized customer experiences. Analyzing personal data such as purchasing habits and behavior while providing customers with a personalized shopping experience demonstrates that AI is a valuable resource to incorporate into the digital business. AI can accurately predict customer behavior by continuously analyzing and organizing data that allows businesses to increase sales and improve the overall customer experience (Hansen & Bøgh, 2021). AI tools for small businesses can significantly improve efficiency, productivity, and decision-making processes across various industries (Sharma et al., 2022). From retail to professional services, AI solutions help small businesses automate routine tasks, analyze data, and provide personalized customer experiences. Critical applications include customer service automation, predictive analytics for inventory management, and AI-powered marketing optimization (Lu et al., 2022). AI tools can streamline bookkeeping and provide insights for better cash flow management in the financial sector. For example, QuickBooks is accounting software designed to simplify financial management for small to medium-sized businesses. The tool offers a variety of features, including invoice creation, expense tracking, and payroll management. With its user-friendly interface, QuickBooks allows business owners to monitor cash flow easily, generate financial reports, and prepare for tax season. For e-commerce businesses, AI can personalize product recommendations and optimize pricing strategies. AI-driven quality control and predictive maintenance can reduce manufacturing costs and downtime. Although implementation may require initial investment and training, the long-term benefits often outweigh the costs (Bettoni et al., 2021). Small businesses that use AI tools can gain a competitive advantage, improve customer satisfaction, and drive growth in an increasingly digital marketplace. Based on the above discussion, the following hypothesis is posited:

H1: AI readiness significantly influences business performance.

2.4 Government Support for AI and Business Performance

Previous studies have discovered that government support is also essential in fostering the use of AI (Adeel et al., 2023; Mohd Noor et al., 2021). Efforts such as grants, incentives, and subsidies can empower contractors to integrate AI tools, ensuring that even small players can participate in this technological shift (Masenya, 2021). Malaysian Budget 2025 provides excellent support to accelerate Malaysia's digitization further, encourage the use of AI, and drive inclusive growth, thus making Malaysia a leading digital hub in the ASEAN region. Through strategic initiatives drawn up, Malaysia is ready to drive regional cooperation in critical areas such as AI, digital

economy, and innovation and strengthen its role in ASEAN and globally. The MADANI government has high hopes of realizing the aspiration of driving AI technology to transform Malaysia into a high-income country. Ministry of Science, Technology, and Innovation launched five (5) technology roadmaps to intensify local technology development and application efforts to make Malaysia a technology-developing country. It is also one of the efforts to reduce dependence on foreign technology and foreign labor and further increase the country's productivity. The five (5) technology roadmaps launched are Electricity and Electronics Roadmap: Technology Development 2021-2030, which aims to increase the added value of the country's electrical and electronics (E&E) products based on scientific progress and high-tech innovation; National Blockchain Technology Roadmap 2021-2025 which aims to strengthen Malaysia's position in Blockchain development and application through cooperation and strategic synergy; Artificial Intelligence Roadmap 2021-2025 which aims to develop artificial intelligence innovation ecosystem; National Advanced Materials Technology Roadmap 2021-2030 which aims to strengthen the local advanced materials innovation ecosystem; National Robotics Roadmap 2021-2030 which identifies the national robotics technology development strategy to make Malaysia a robotics hub with a focus on high-impact sectors. The National AI Roadmap is a reference document to improve the quality of life of Malaysians by applying AI technology while accelerating the country's transformation into a high-tech nation. The roadmap also outlines seven principles to guide the development of reliable and responsible AI: justice, reliability, security and control, privacy and security, inclusiveness, transparency, accountability, and human welfare and happiness. To improve the quality of products and services and ensure a strong business reputation, entrepreneurs should be aware of and move along with the latest technological developments (Halim et al., 2023). Thus, the following hypothesis is posited:

H2: Government support for AI significantly influences business performance.

2.5 Business Innovation as a Mediator

Most studies that previous researchers carried out showed a positive relationship between innovation and business performance (Soluk et al., 2021; Trevlopoulos et al., 2021; Veronica et al., 2020). The study's results by Liu et al. (2022) found that innovation is limited to developing new products or services and involves changes in the business model. Business innovation allows companies to respond to market dynamics more flexibly and adaptively. Business innovation includes changes in products or services offered and transformations in how companies operate and value the market (Kanbach et al., 2024). Innovative business models can create new opportunities, change how companies interact with customers, and provide significant added value (Trevlopoulos et al., 2021). In the context of digital transformation, business innovation is the key to optimizing the use of information technology. Companies combining business innovation with innovative technology adoption can achieve a competitive advantage. For example, adopting a platform or ecosystem-based business model can enable closer collaboration with business partners, create more excellent ecosystem value, and increase the company's competitiveness in the digital market. The importance of business innovation also lies in its ability to create differentiation (Soluk et al., 2021). Successful business innovation can create advantages that are difficult for competitors to imitate. Thus, in responding to the ever-changing market dynamics, companies need to consider product and service innovation and must also be active in redesigning their business models. Alignment between business innovation and technology adoption is critical to achieving a holistic transformation that supports competitive advantage in this digital era. Innovation is the most crucial element that influences entrepreneurial orientation. Innovation and creativity are critical successes to a business, especially with the often changing and uncertain economic conditions (Veronica et al., 2020). Therefore, the following hypothesis is postulated:

H3: Business innovation mediates the relationship between (a) AI readiness and (b) government support for AI and business performance.

Figure 1 portrays the conceptual framework of the study.

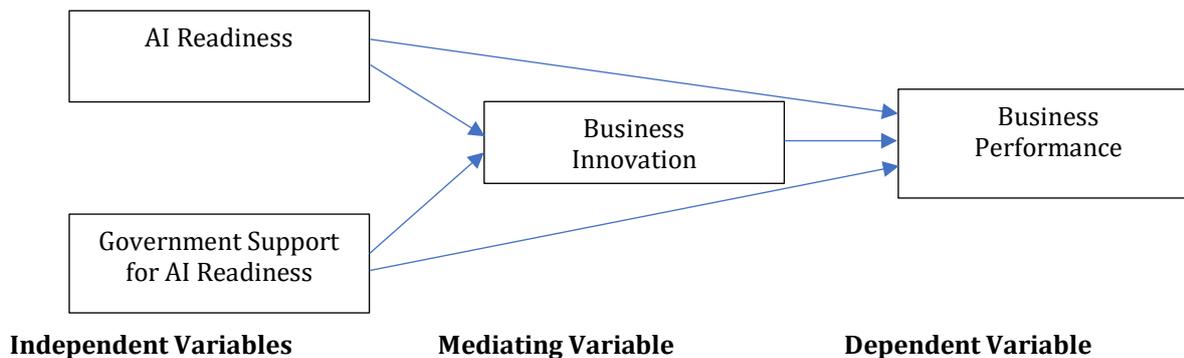


Fig. 1 Research model

3. Methodology

This study uses a questionnaire as a data collection instrument. Negeri Sembilan covers an area of 6,645 square km or 664,591 hectares. The state capital of Negeri Sembilan is the city of Seremban. There are seven districts: Seremban, Jelebu, Jempol, Rembau, Tampin, Kuala Pilah, and Port Dickson. When the population value (N) is 100,000 and above, then the minimum sample size (n) required is only 384 (Krejcie & Morgan, 1970). Thus, the study sample size is 384 young entrepreneurs. This study uses purposive sampling based on criterion sampling. Among the sampling criteria acceptance criteria (inclusive) are youth entrepreneurs aged 18-30, owning SMEs registered businesses either operating on a full-time or part-time basis and living in Negeri Sembilan, Malaysia. Youth refers to individuals between the ages of 15 and 40. The Ministry of Youth and Sports has announced the implementation of the youth age limit of 30 years, which will start on 1 January 2026. For this study, data are collected from youth aged 18 to 30. Measurement items were developed based on literature from previous studies (see Table 1). The items were measured using the five-point Likert scale, which requires the respondents to identify whether they agree or disagree (Option 1, strongly disagree; Option 5, strongly agree). The data analysis tool used is a structural equation model (SEM) with AMOS 26. SEM is an evolution of the multiple equation models developed from econometric principles, and combined with regulatory principles from psychology and sociology, it has emerged as an integral part of academic and managerial research.

Table 1 Measurement of the variables

Variables	Items
AI Readiness (Badghish & Soomro, 2024)	<ol style="list-style-type: none"> 1. Implementation of AI reduces operation costs in the long term. 2. Understanding the AI system is relatively easy. 3. Integrating an AI system within the company’s existing system is easy. 4. AI technology can provide higher economic benefits. 5. AI technology can provide better operational performance.
Government Support for AI (Badghish & Soomro, 2024)	<ol style="list-style-type: none"> 1. The government provides financial support (subsidies) for adopting AI. 2. The government provides technical assistance for adopting AI. 3. The government provides support in training the workforce with AI technologies.
Business Innovation (Seyfang & Smith, 2007)	<ol style="list-style-type: none"> 1. Creating new ideas, processes, products, and systems is critical to the success of our firm. 2. Our firm is an early adopter of innovative technologies. 3. Our firm actively seeks innovative technologies. 4. Our firm proactively uses innovative technologies to meet changing customer needs.
Business Performance (Hashai, 2011)	<ol style="list-style-type: none"> 1. Sales volume. 2. Profit. 3. Return on investment. 4. Customer satisfaction. 5. Customer long-term retention.

4. Findings

4.1 Demographic Profiles

Out of 384 surveys distributed, 240 responses have been received. The profile of the study respondents is summarized in Table 1. Out of 240 respondents, there are 118 male young entrepreneurs (49.2%) and 122 female young entrepreneurs (50.8%). From age groups, most respondents were 28 – 30 years old, with 144 respondents (60%). The study also found that most respondents have obtained a bachelor's degree qualification, with 118 respondents (49.2%). Then, 200 respondents have business experience of 1 to 5 years (83.3%). The majority of respondents have operated their business on a part-time basis (n=121, 50.4%). Most respondents owned the clothing business, with 110 respondents (45.8%). Moreover, most respondents have two employees (n=100, 41.7%).

Table 2 Demographic profiles

Profile		Frequency (n)	Percentage (%)
Gender	Male	118	49.2
	Female	122	50.8
Age	18-20 years	12	5
	21 – 24 years	28	11.7
	25 – 27 years	56	23.3
	28 – 30 years	144	60
Highest Educational Level	Secondary Level	5	2.1
	Diploma/Foundation	101	42.1
	Bachelor's degree	118	49.2
	Postgraduate	14	5.8
	Others	2	0.8
Business Experience	1 to 5 years	200	83.3
	Five years and above	40	16.7
Business Orientation	Full-time	119	49.6
	Part-time	121	50.4
Types of Business	Retail	23	9.6
	Food	58	24.2
	Crafts	20	8.3
	Services	17	7.1
	Tourism	5	2.1
	Manufacturing	3	1.3
	Agriculture	0	0
	Clothes	110	45.8
Number of Employees	Others	4	1.6
	No employees	14	5.8
	One employee	37	15.4
	Two employees	100	41.7
	≥ 3 employees	89	37.1

4.2 Confirmatory Factor Analysis (CFA)

The validity of the measurement model of this study uses confirmatory factor analysis (CFA). The first stage of this test requires an evaluation of the suitability of the model based on the statistical goodness-of-fit (GOF) value that has been set (Hair et al., 2010). A model is said to be fit if it meets the relative chi-square index (χ^2/df) value is below 5, the comparative fit index (CFI), Goodness of Fit (GFI), and the Tucker–Lewis's index (TLI) values exceed 0.90. In contrast, the Root Mean Square Error of Approximation (RMSEA) does not exceed 0.08. The measurement model proposed by the researchers showed a good matching index value as well as meet the criteria suggested by scholars (Hair et al., 2010): $\chi^2/df= 2.389$ at $p \leq 0.001$; RMSEA =0.0456; GFI=0.920, TLI= 0.910; CFI = 0.920. Figure 2 portrays the CFA model for the study.

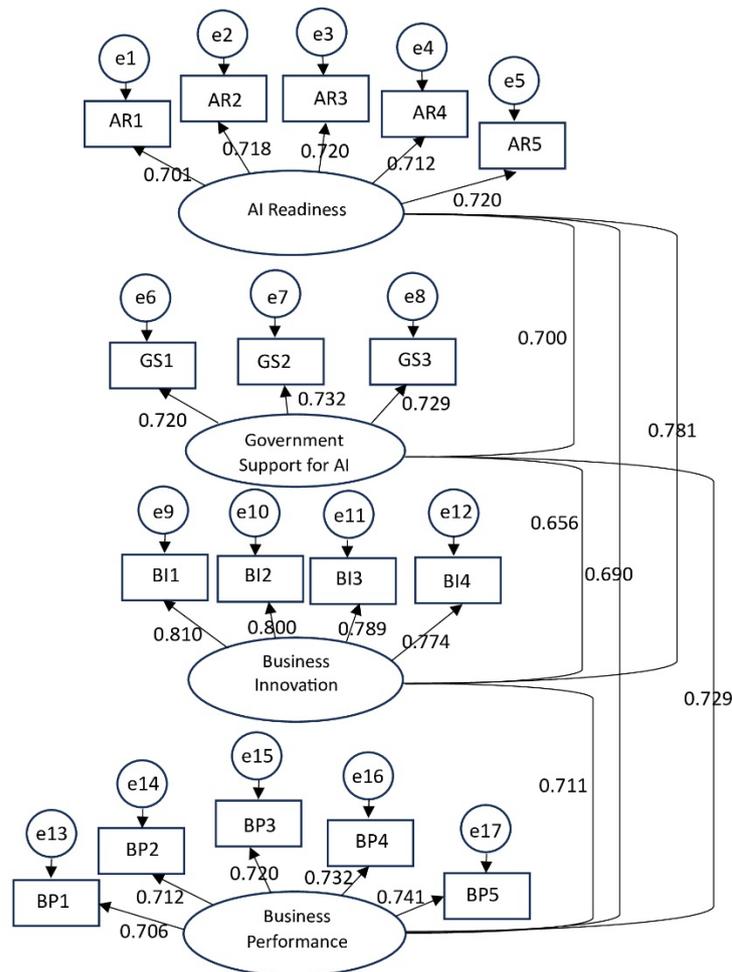


Fig. 2 CFA model

4.3 Convergent and Discriminant Validity

Validity concerns the level of accuracy an indicator achieves in assessing something or the accuracy of measurement of what should be measured. Reliability is a measure of the internal consistency of the indicators of a construct that shows the degree to which each indicator indicates a general construct. Because the indicator is multidimensional, the validity of each variable will be tested by looking at the factor loading of the relationship between each observed variable and the latent variable. At the same time, reliability is tested with Cronbach's Alpha. Based on the results of the confirmatory factor analysis, the factor loadings of each of the question indicators that make up each variable are mostly ≥ 0.5 , thus, the instrumentation indicators of each construct can be said to be valid enough and acceptable. The results of consistency reliability testing internally for each variable above show good results where the Cronbach's Alpha coefficients obtained all meet the required rules of thumb, which are ≥ 0.70 (Hair et al., 2010). Variables can also meet convergent validity if the Average Variance Extracted

(AVE) value exceeds 0.50. Based on Table 3, all research variables have an AVE value exceeding 0.50, which means that the variables used are valid and can be continued at the next stage. Based on Table 3 also, the Composite Reliability (CR) value of each variable is above 0.70 (Hair et al., 2010), and the Cronbach's Alpha value of each variable is above 0.70 (Nunnally, 1978). This indicates that all the variables in the research meet the criteria and are declared reliable. Next, the indicators on each variable can be said to meet discriminant validity when the cross-loading value of a variable has a more excellent value than the cross-loading value of other variables and the value is above 0.70 (Fornell & Larcker, 1981). Based on Table 4, the cross-loading value of the indicator on each variable has a higher value than the cross-loading value of other variables and has a correlation value above 0.70. It can be concluded that the indicator on each variable is valid and meets the discriminator validity test.

Table 3 Item loadings, AVE, CR, and Cronbach's Alpha

Variable	Items	Item Loadings	AVE	CR	Cronbach's Alpha
AI Readiness	AR1	0.701***	0.812	0.800	0.720
	AR2	0.718***			
	AR3	0.720***			
	AR4	0.712***			
	AR5	0.700***			
Government Support for AI	GS1	0.720***	0.819	0.830	0.820
	GS2	0.732***			
	GS3	0.729***			
Business Innovation	BI1	0.810***	0.744	0.810	0.800
	BI2	0.800***			
	BI3	0.789***			
	BI4	0.774***			
Business Performance	BP1	0.706***	0.789	0.822	0.840
	BP2	0.712***			
	BP3	0.720***			
	BP4	0.732***			
	BP5	0.741***			

Table 4 Discriminant validity results

No.	Variable	1	2	3	4
1	AI Readiness	0.901			
2	Government Support for AI	0.700**	0.904		
3	Business Innovation	0.781**	0.656**	0.862	
5	Business Performance	0.690**	0.729**	0.711**	0.888

Note: Values in the diagonal show the square root of AVE

4.4 Assessment of Hypothesized Model

As shown in Table 5, the study first discovered that AI readiness ($\beta=0.417^{***}$) and government for AI ($\beta=0.305^{***}$) significantly influenced business performance. Thus, H1 and H2 were accepted. Second, business innovation significantly influenced business performance ($\beta=0.216^{***}$). Third, AI readiness ($\beta=0.382^{***}$) and government support for AI ($\beta=0.605^{***}$) significantly influenced business innovation.

Table 5 Assessment of the direct model

Path		β	Std. Error
Standardized Direct Effects			
Business Performance	← AI Readiness	0.417***	0.043
Business Performance	← Government Support for AI	0.305***	0.080
Business Performance	← Business Innovation	0.216***	0.155
Business Innovation	← AI Readiness	0.382***	0.122
Business Innovation	← Government Support for AI	0.605***	0.097

Next, in assessing the mediation model, the study discovered that AI readiness ($\beta=0.287^{***}$) and government support for AI ($\beta=0.211^{***}$) still significantly influenced business performance. Second, business innovation significantly influenced business performance ($\beta=0.199^{***}$). Third, AI readiness ($\beta=0.286^{***}$) and government support for AI ($\beta=0.490^{***}$) significantly influenced business innovation. The significant influence of AI readiness and government support for AI on business performance has proved that business innovation is a partial mediator. The bootstrapping method with resampling 2000 times and a 95% bias-corrected confidence interval is used to assess the mediating effect of business innovation. This method involves imputing study variables in structural equation modeling (Preachers & Hayes, 2008). Table 6 shows the bias-corrected 95% confidence interval analysis for AI readiness ($\beta=0.056$, BC 95% CI [0.230, 0.843]) and government support for AI ($\beta=0.097$, BC 95% CI [0.029, 0.248]) do not contain zero values. These results show that business innovation is a significant mediator for relationships. Therefore, H3(a) and H3(b) were accepted.

Table 6 Assessment of the mediation model

Path		β	Std. Error	Bootstrap (95% CI)	
Standardized Direct Effects				Lower control limit	Upper control limit
Business Performance	← AI Readiness	0.287***	0.194		
Business Performance	← Government Support for AI	0.211***	0.155		
Business Performance	← Business Innovation	0.199***	0.185		
Business Innovation	← AI Readiness	0.286***	0.107		
Business Innovation	← Government Support for AI	0.490***	0.054		
Standardized Indirect Effects (Mediation Effect via Business Innovation)					
Business Performance	← AI Readiness	0.056***	0.039	0.230	0.843
Business Performance	← Government Support for AI	0.097***	0.046	0.029	0.248
Standardized Total Effects (Direct Effect + Indirect Effect)					
Business Performance	← AI Readiness	0.343***	0.219		
Business Performance	← Government Support for AI	0.308***	0.044		

Note: ***Paths are significant at the 1% level ($p < 0.01$). ***Indirect effects are significant at the 1% level, with bootstrap at 5000 and bias-corrected percentile method

5. Discussion

This study examines the impact of AI readiness, government support for AI, and business innovation on SME performance. The results proved that the future of AI tools for small businesses is auspicious as this technology continues to evolve and become more accessible. With machine learning and automation advances, AI tools are set to change how small businesses operate, offering more innovative solutions for everything from customer service to inventory management (Hansen & Bøgh, 2021). As AI becomes more intuitive, small businesses can expect enhanced personalization, improved decision-making, and increased efficiency (Bettoni et al., 2021). Integrating AI with emerging technologies such as the Internet of Things (IoT) and blockchain will further expand capabilities, allowing businesses to simplify operations and reduce costs (Wei & Pardo, 2022). The second is to examine the indirect path of business innovation on the proposed relationship. The findings have discovered that AI readiness, government support, and business innovation influence SME performance. Moreover, business innovation has a strategic impact on the growth and success of the SMEs. It acts as a mediator to strengthen the impact of AI readiness and government support for AI on business performance. Innovation improves products and processes, helps SMEs survive, enables the company to grow faster and more efficiently, and ultimately makes the business more profitable (Kanbach et al., 2024; Noor & Fuzi, 2024). SMEs with innovation capabilities will respond more quickly to environmental changes compared to companies that do not have innovation capabilities (Soluk et al., 2021; Trevlopoulos et al., 2021; Veronica et al., 2020). The SMEs' inability to innovate will cause the business not to grow and eventually be eliminated from business competition. This study has contributed to understanding SMEs' readiness for AI and digital technology in Malaysia from more in-depth aspects by

considering the effect of technology, organization, and environment. This study contributes to developing the TOE model through quantitative findings that improve understanding of entrepreneurship and digital technology.

The government must train, guide, and mentor SME entrepreneurs in digitizing their business operations. Indirectly, this initiative can help improve productivity and results and a better profit margin (Mohd Noor et al., 2024). A public and private sector collaboration needs to be carried out as a corporate social responsibility (CSR) program. Moreover, SMEs must invest in continuous training programs to ensure that employees always have the skills to use new technologies. Involving staff in the change process ensures they embrace and support the digital transformation. This includes allowing them to provide feedback and participate in the planning process. Clear communication is essential to ensure that all stakeholders understand the purpose and benefits of digital transformation. This includes consistent and transparent communication about impending changes. The government must also provide collective Internet access to communities, and various ICT-based courses and training that promote digital creation, dissemination, and mastery of digital knowledge must be consistently introduced (Noor, 2024). These various entrepreneurship courses and training include relevant topics such as ICT training, entrepreneurship training, AI and multimedia training, e-learning, and marketing training. The entrepreneurs also need to be given direct and practical exposure to Financial Digitization, Point-of-Sale (POS)/Digital Warehouse, eWallet/Payment Gateway, Internet Services, On Demand Service Applications, E-Commerce Platforms and WhatsApp Business, Digital Retail, Route to Halal, Trademarks, Content Production and Affiliate Marketing, SMEs: Step Up Digital as well as AI and CI.

6. Conclusion

Information technology (IT) applications are powerful tools that can improve businesses of all sizes. By understanding the latest trends in IT, it can improve communication, customer relationship management, enterprise resource planning, supply chain management, data analysis, and security. It can help businesses improve efficiency, productivity, and customer satisfaction, reduce costs, make better decisions, and increase competitive advantage. Overall, the results of this research illustrate that the successful implementation of innovative strategies in the digital era requires a holistic approach that involves innovation in various aspects of business, including products or services, business models, operational processes, and interaction with customers. However, challenges such as resistance to change, resource limitations, and technology integration difficulties must be overcome with effective management. SMEs should conduct an in-depth evaluation regarding technology readiness and adopt a solution that suits business needs. Collaboration and joint learning can effectively overcome obstacles and promote innovation. Like previous studies, this study is also not free from limitations. First, the sample size needs to be bigger, causing limited generalization of research findings. In addition, the background of the study participants involved is also limited to SMEs in Negeri Sembilan only. Future studies need to employ the study in different contexts. Second, variables were assessed by self-report, which may raise questions on social bias. Future studies should employ other methods, such as observation and focus group discussion, to address this issue. Third, this study was conducted cross-sectionally, involving various data collected simultaneously. The weaknesses are that no data can be used to determine the causal relationship between the studied variables. Future studies should use longitudinal studies to deal with problems related to cross-sectional data. Regarding the variables studied, future studies may consider other mediators such as knowledge, motivation, or demographic factors.

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Conflict of Interest

The authors declare no conflict of interest regarding the paper's publication.

Author Contribution

Amirah, M. F., and Nurin Farzana, M. F. conceived and planned the experiments. Afief, E. A. contributed to interpreting the results. Nurul Hidayana, M. N. took the lead in writing the manuscript. All authors provided critical feedback and helped shape the research, analysis, and manuscript.

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