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Causal Relationship Model of Artificial Intelligence on Marketing Mix and Preparedness of Small and Medium Enterprises in Bangkok Metropolitan Area

By

Uday Shankar Verma, Sudawan Somjai, Ananta Rusmee
Graduate School, Suan Sunandha Rajabhat University, Bangkok, Thailand
Email: s61584917037@ssru.ac.th

Abstract

The readiness of organization is crucial for the adoption of new technology. However, not many empirical works have explored the adoption of AI in small and medium enterprises (SMEs) in Thailand. The present study explored the influence of technological, organizational and environmental contexts in the adoption of AI in Thai SMEs and Bangkok Metropolitan Area in particular where maximum businesses are concentrated. The study carried out research to establish causal relationship for the adoption of artificial intelligence (AI) which has the potential to transform the business in terms of marketing mix. In this study, the data was collected from 320 respondents employed in different Thai service sector SMEs. To facilitate this study, a structure with three variables, namely dependent (preparedness of SME), independent (technological, organizational, and environmental contexts) and mediating variable (marketing mix) was developed. PLS-SEM modelling was utilized to explain the proposed hypothesis. It was revealed that technological, organizational, and environmental contexts, in terms of adoption at leadership and individual level and openness of SME was effective in the adoption of AI in SME. Further, the mediating role of marketing mix indicated that use of AI-tools in the marketing strategy would further support the adoption of AI. The study implied that the probability of adoption of AI in SMEs would be benefitted by a positive attitude towards the technological changes adoption.

Keywords: Artificial intelligence, Marketing Mix, Technological, Environmental, and Organizational contexts, SMEs, Thailand

Background and Significance of problem

Just about two decade ago from now smart phones, laptops, digitalization, online marketing, and voice based virtual assistants like Alexa and Google Home were not part of the lives. Inclusion of Big Data and AI have significantly changed the situation. Now, more than half of the people on planet earth have access to handheld devices that possess more computing power than the space stations had in the early twentieth century. The speed of transformation continues to pick up even at the faster pace. Technological enhancement has led to the emergence of a new society that must adapt to changes. New technologies have a great extent of social, economic, political and environmental implications. Artificial Intelligence in particular started to shape our homes, businesses, policies, governments and environment. Artificial intelligence, synonym with machine intelligence, is a disruptive emerging technology with the potential to transform the business in terms of new production, novel business practices and marketing strategies,

automating tasks, competitive edge, improved customer deliverance and so forth (Sandkuhl, 2019). Different AI technologies like machine learning (ML), natural language processing (NLP), deep learning (DL) and artificial neural networks (ANN) enables speedy processing of large data in a short time and at a lesser cost. By virtue of this, AI technology has found wide applications in different business industries including food business, E-commerce, autonomous vehicles, medical field, etc. (Chopra, 2019). Major enterprises/organizations such as Facebook, IBM, Netflix, Microsoft, Uber, Google, etc. are using AI to improve their production and operation activities worldwide (Kumar & Kalse, 2021). Overall in every discipline, AI has transformed business activities, the interaction between the company and their customer base has become more enterprising and engaging. Other AI-supported activities have been launch of new products, talent acquisition, reduced power costs, improved logistics and sourcing systems. Though well utilized by big companies, the use of AI by small businesses such as SMEs is still in its nascent stage.

Research objectives

1. To analyse the extent of preparedness of the Thai SMEs in adopting AI technologies and applications for business benefits.
2. To identify the factors that influence the preparedness of the Thai SMEs to adopt AI technologies.
3. To examine the mediating role of marketing mix in influencing the relationship of technological and environmental contexts with the preparedness of Thai SMEs for the adoption of AI.
4. To examine the influence of organizational context, technological context, environmental context and marketing mix on the preparedness of Thai SMEs for the adoption of AI.

Literature review

With the potential to transform the business, AI is paving its way to SMEs at a slower pace. Using qualitative analysis Nugroho et al. (2017) reported pressure from the customer and ease of use as the motivating factor in AI adoption by SMEs in Yogyakarta, Indonesia. However, there are barriers in the adoption of AI at multiple levels. Aarstad and Saidl (2019) listed about 20 significant barriers from the organizational, technological and environmental context in the adoption of AI by Nordic SMEs. According to Watney and Auer (2021), integration of AI in SMEs demands large financial investment in IT systems as well as hiring of technical talent which can be a costly affair for small businesses. Nevertheless, there are multiple advantages of AI in SMEs. AI tools can aid in competitive analysis to identify the strength and weakness of the competitors, aid in managing marketing, build customer relationship management and sales discussions with consumers. Especially in manufacturing sector SMEs, the use of AI has boosted productivity. In a review of 37 publications with a main focus on manufacturing SMEs, it was observed that AI and internet of things (IoT) supported analytic capabilities like descriptive, diagnostic, predictive and prescriptive analytics (Hansen & Bøgh, 2021). In literature there was limited empirical research on the knowledge of key drivers of AI adoption in SMEs.

Table *below summarizes significant literature review done for this study*:

Authors and findings	Technological Context
Damerji, 2020	It was found that the proposed Technology Readiness and Acceptance Model could successfully predict the accounting students' technology adoption of AI.
Alsheibani, et al., 2019	It was found that the level of adoption of AI could be categorised into three chief phases: 'initiation', 'adoption', and 'implementation.'
Rao, 2017	It was found that technological facets such as technology integration, technology readiness, and technical complexity were prominent in the decision to adopt AI.
	Organizational Context
Oliveira & Martins, 2011	The characteristics of individuals differ between those who adopt an innovation early and those who adopt later. There are five types of adopters: innovators, early adopters, early majority, late majority, and laggards.
Oliveira, et al., 2014	The adoption of innovation in firms is affected by three factors: individual (attitude of leadership towards change), internal structure of the organization (centralization, intricacy, interconnectedness, organizational slack, employee strength), and external structure (operation of systems) of the firm.
Lundberg and Åkesson, 2015	Eleven key factors obstruct and delay an adoption of cloud computing for traditional banks in Sweden: Integration, Lack of competence, Sensitive information, Heritage, Employee resistance, Miscommunication, Size and structure, Common heritage, Standard agreements, New actors and Regulations.
	Environmental Context
DePietro et al., 1990	Effective adoption of technology is not related merely to suitable technology. Instead, various aspects within organisational, technological, and environmental settings affect the effective adoption of IS at the firm level.
Zhu et al., 2010	The environmental context affects the process of technological innovation, and includes elements of the market, competitors, and the governing environment. Further, it can include external organisations which have the appropriate expertise to facilitate adoption of the technology.
	Marketing Mix Factors
Roose, 2019	Using artificial intelligence and its technologies make businesses capable to combat the vibrant and highly fluctuating prices by gathering real time data from the market
	Preparedness of SME
Parasuraman & Colby, 2001	Technological readiness combines beliefs related to technology which are both favourable and unfavourable and assumes that these beliefs differ between individuals.
Parasuraman, 2000	There are four aspects of these beliefs namely, "optimism, innovativeness, discomfort, and insecurity"
Lin, Shih, Sher, & Wang, 2005	Technology readiness and acceptance model (TRAM) explains how aspects of personality can impact the manner in which individuals relate to, experience, and utilise new technology.
	Conceptual Framework of the Study
Phonthanukitithaworn & colleagues (2015)	The study utilised an extended TAM model incorporating constructs from the DOI theory and perceived risk to investigate technology adoption in the context of mobile payment (m-payment) services by consumers in Thailand.
	Studies from Thailand
Kijsanayotin et al. (2009)	Used the Unified Theory of Acceptance and Use of Technology (UTAUT) model with modifications to gain awareness of the factors influencing the adoption of health information technology (HIT) in community health centers (CHC) in Thailand.
Suebsin and Gerdsri (2010)	Explored ERP adoption in the healthcare context in Thailand using a qualitative approach with in-depth interviews. They found that five factors affected technology adoption in the studied context namely, routine job, ERP capability, change of work process, user resistance, and complexity.
Chooprayoon and Fung (2010)	Used TAM to explain e-commerce adoption and usage among Thai SMEs. They hypothesised that PU of public and private sectors and the online consumer are positively related to attitude towards e-commerce technology and intention to utilise e-commerce technology.
Chooprayoon (2011)	Found that environment of business, capital and organisation, awareness of e-commerce technology, and e-commerce technology impacted the adoption of e-commerce technology among Thai SMEs.
Sirirak & Islam (2010)	A slightly different approach was utilised by Sirirak and Islam as they investigated the association between adoption of ICT and productivity of hotels in Thailand. Assessment of the extent of adoption of ICT was performed using three facets: availability of ICT component, integration of ICT component, and intensity of usage of ICT component.
Puriwat & Tripopsakul (2017)	The study of Puriwat and Tripopsakul examined the factors that impacted the intentions of consumers to utilise mobile banking. They proposed a model for adoption of mobile banking based on TAM and Mobile Service Quality (MSQ), the dimensions of MSQ being design and aesthetics, security and privacy, enjoyment, practicity, and sociality
Saengchaia, Pattanapongthornb, and Jermsittiparsertc (2019)	TAM was also utilised by Saengchaia, Pattanapongthornb, and Jermsittiparsertc as the underlying framework to assess the perceptions of hospital staff with regard to ICT adoption. The study found that subjective norm has a significant impact on the intention of hospital staff to adopt ICT.

SMEs in Thailand

In developing countries like Thailand, SMEs are the major contributors of economic development (Chienwattanasook & Jermsittiparsert, 2019; Chetthamrongchai & Jermsittiparsert, 2020). In 2002, the Department of Industrial Promotion (DIP), under Thailand's Ministry of Industry (MoI) categorized three types of SMEs, namely production sector SME, service sector SME and trading sector SME. As of 2010, the Thai official government reported nearly 2.82 million registered SMEs with the Ministry of Commerce which increased to 3.01 million by the year 2016 (Chalita, 2014). As per data from the Office of Small and Medium-sized Enterprise Promotion there were about 818,182 SMEs in the Bangkok region alone. In Thailand SMEs are defined based on number of employees, enterprise with <50 employees and total fixed asset excluding land worth ≤50 million Thai Baht (THB) is referred to small-size enterprise, while medium size industry have <200 employees and assets worth ≤ to 50 million THB (Chalita, 2014). As of 2014, nearly 99.28% of Thai service sector was constituted by 1,036,598 SMEs and employed a maximum number of labor force corresponding to 4,701,144 employees or 80.53% of the country's employment. In 2016, the number of SMEs in the service sector increased to 1,189,373 SMEs indicating a constant rise in the number of SMEs and their contribution to the Thai economy. Nevertheless, the improvement in adoption of technology by SME was inadequate likely due to the limitation at financial and human resource level. A barrier to adoption of technology by SME was found at organizational, environmental, technological and individual level (Antlová, 2009). In a qualitative analysis involving 30 entrepreneurs of SMEs from Thailand, participants disclosed lack of public policy and government support, financial constraints, poor capital knowledge, reduced skilled labors and poor marketing management as the possible threat for the sustenance of SMEs (Sakolnakorn, 2010). In the same line, Sriphaiboon and Somjai (2019) reported that besides lacking financial support the entrepreneurs of Thai SMEs lacked systematic knowledge and information on technological innovations. Further, they lacked training in accordance with the requirements of SMEs. Overall, a lack of research on the adoption of AI in Thai's SMEs, in particular from Bangkok province, was noted.

It is gathered from the literature that AI can benefit the organization manifold. In this context, it can be inferred that SMEs can also gain from the AI by using their general AI tools as a service platform. However, SMEs have several limitations like poor financial resources, lack of skilled workers, hesitation to adopt advanced technology, government policies, etc. Hence it is essential to explore the influence of factors from the context of organization, technology and environment in the adoption of AI by SMEs. The focus of the present research was to identify the factors that influences the preparedness of the Thai service sector SMEs to adopt AI technologies.

Marketing mix

Marketing mix constitutes 4Ps, namely, products, price, promotion and place based on which the marketers configure the offerings to suit customers' needs (Singh, 2012). Londhe (2014) proposed 4Vs marketing mix model for the modern business which emphasizes valued customers, value to the customer, value to the society and value to the marketer. According to this, besides catering to the customer needs, for the marketer, the tangible and intangible benefits associated with the products and services help to create a brand image/value which is essential for survival in the competitive world. SMEs managers from Bolgatanga Municipality, Ghana felt that adoption of marketing mix is limited due to lack of marketing knowledge and their costly affair. Further, an already well-established customer base can limit the use of marketing mix. The study has an implication for managers to establish the marketing mix not for just short-term goals like improved sales but for long-term goals to develop the enterprise

further and create an image of the company (Caesar et al., 2017). On the contrary, Wieland (2018) showed that a structured marketing-mix management involves establishment of clear measurable objectives and standardization of policy on price and product attributes, features and their launch. The interdependency of these variables allowed German-based B2B SMEs to introduce new products and penetrate into new markets with higher efficiency and lower costs.

In the context of AI application in marketing, AI applications like voice processing, text processing, image recognition and processing, autonomous vehicles and robots can impact all 4Ps of marketing mix such as hyper personalization of product, price management suiting customer demand, promoting products using personalized communication and convenient shopping and so forth. Besides consumer value delivery, marketing management is saved from time-consuming activities and creates a new marketing ecosystem which supports creative activities, innovation and inclusion of new competencies (Jarek & Mazurek, 2019). Further, Huang and Rust (2021) proposed three-stage strategic framework involving mechanical AI (standardization), thinking AI (personalization) and feeling AI (renationalization) to influence not only the 4Ps but 4Cs (customer, cost, communication and convenience) of marketing mix and to create a balance between the marketer and customer. From the literature it can be gathered that in large businesses like McDonalds, Amazon, etc. the application of AI in marketing mix has benefited the company to enter and operate in the competitive market and it is continuously progressing. Thus, AI in the marketing mix of SME can also be integrated for the potential benefit of AI.

Technological, organizational and environmental contexts

Technological context

In the context of SME, survival of SME depends on technological innovations such as availability of sophisticated machines and equipment, integration of new technologies, gadgets and machines (Rahman et al., 2016). In the present study, technological context included tech competence, relative advantage and ease of use. The participants agreed to the excellent technological context, in terms of accessibility to supplies and equipment, sufficient support and AI tools for the adoption of AI in SME. It can be inferred that to an extent there is an integration of AI in Thai SMEs. In the implementation of AI in manufacturing SMEs, Truvé et al. (2019) explored perceived direct and indirect benefits of AI and compatibility of AI with existing technology as the components of technological context. Similar to Truvé et al. (2019), Savola et al. (2018) included the same items in the exploration of AI adoption in marketing in SMEs in Finland and Sweden. On the contrary, Jadhav (2021) included complexity and compatibility as the technological factors and found that compatibility did not influence AI adoption in Indian SMEs. According to Ifinedo (2011) the perceived relative advantage of internet adoption facilitated technology adoption in Canadian SMEs. The compatibility and complexity did not support internet adoption. Yet in another study, using qualitative analysis Nugroho et al. (2017) reported pressure from the customer and ease of use as the motivating factor in AI adoption by SMEs in Yogyakarta, Indonesia. In terms of technology adoption, Alharbi et al. (2016) reported that business factors are the main determinants of technology adoption. For example, Cloud Computing adoption in the healthcare sector of Saudi Arabia was influenced by both human and organisational factors such as relative advantage, top manager support, attitude toward change, CIO innovativeness, internal expertise, compatibility, prior technology experience. Thus, it could be inferred that factors determining the AI adoption can depend on the type of organisation and requirements of the organisation. Technological factors affecting AI adoption in multiple industries including SMEs have been explored globally. Aarstad and Saidl (2019) listed technological barriers such as unclear benefits of an AI initiative, lack of AI understanding and incompatibility between AI solution

and organization's IT system in AI adoption in European SMEs. Thus, it can be postulated that multiple technological factors including technological capability, compatibility, and relative advantage can affect the preparedness of SMEs in AI adoption.

Organizational context

Organization context refers to the number of employees, ownership, skilled personnel, competitiveness, revenue, management support, etc. The characteristics of entrepreneur and organization are important for the growth and development of small companies. An early study on SME entrepreneurship indicated that resources and competitive strategy of the personnel are more crucial for the SME entrepreneurs. In the present study, organizational context was addressed using three items, namely, leadership level adoption, individual level adoption and system openness. The level of adoption by leaders and employees had a higher influence than system openness. In the implementation of AI in manufacturing SMEs, Truvé et al. (2019) explored existing technical skills, readiness to direct adequate funds and the top management support as the components of organizational context. Savola et al. (2018) included existing firm size, technical skills, customer knowledge management, financial resources, top management support, culture and ethical aspects as the main items for exploring the AI adoption in SMEs. Jadhav (2021) found that enhanced IT sophistication and management support played a significant role in effective AI adoption. Similarly, Ifinedo (2011) reported influence of management support on adoption of internet and e-business technologies (IEBT) by Canadian SMEs. According to the author, if top management employees extend their support in the adoption of technology, then organizations as well as individual employees will consider it as a priority for the project. The adoption of AI in government authorities was influenced by management support and staff capacity. According to the author, skill and knowledge of an individual as well as the support in the form of training will support the adoption of AI (Stenberg & Nilsson, 2020). Aarstad and Saidl (2019) reported a multitude of organizational barriers in the adoption of AI in European SMEs. Organizational factors like lack of prior AI experience, resistance to change, employee's age, lack of training, lack of AI competence, financial and resources constraints, sceptical about AI trends, poor business strategies are likely to hinder AI adoption in SMEs.

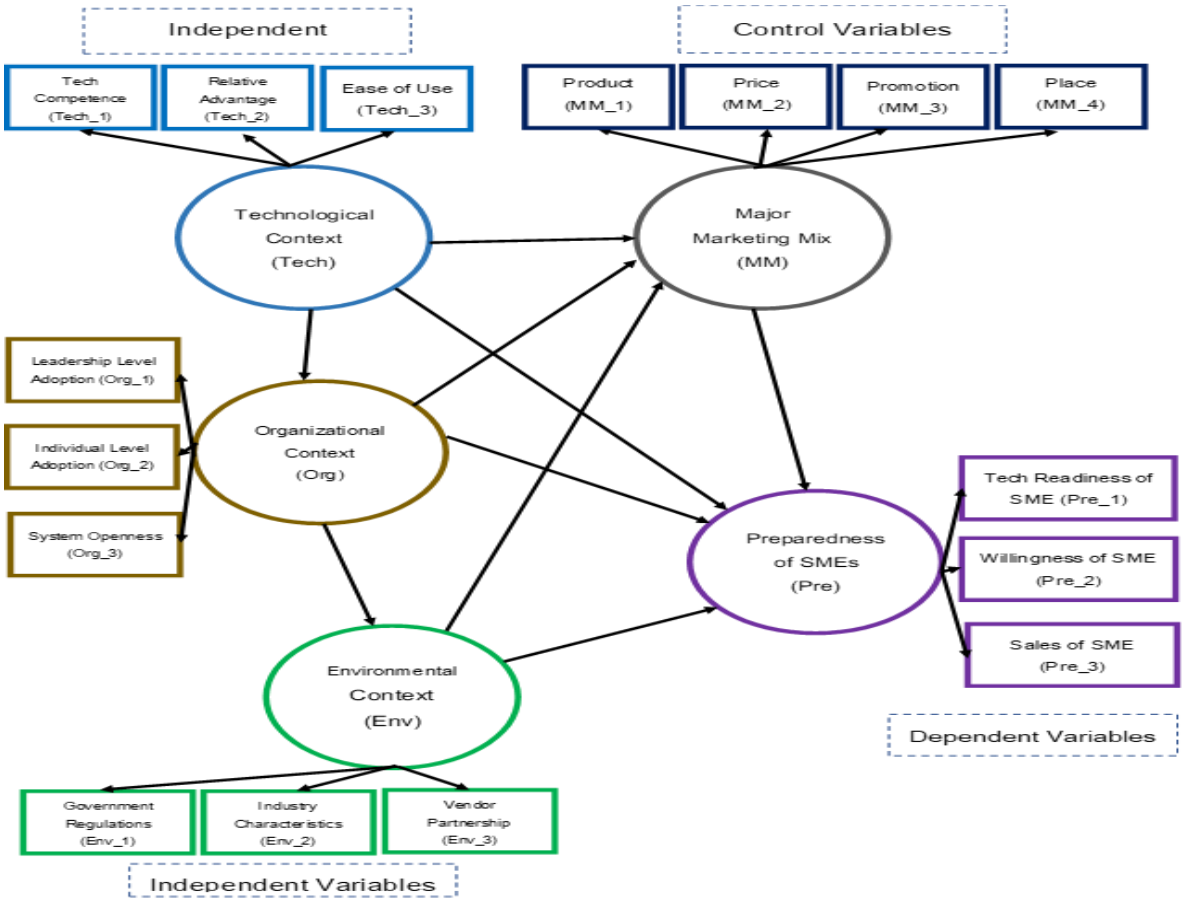
Environmental context

In the present study, in the context of environmental factors, namely three variables, government regulations, industry characteristics and vendor partnership were evaluated. The influence of environmental context in the adoption of AI in Thai SMEs was not highly significant. In this study, the respondent's response to government support for the AI adoption in SME was found to be neutral. On the contrary, use of AI by peers of the industry and additionally, SMEs tie up with relevant vendors for AI support. In agreement with the present findings, Truvé et al. (2019) found that in manufacturing SMEs, competition threat, pressure from other industries and customer expectation were not the antecedents of AI adoption. It was likely that SMEs had not integrated AI into the manufacturing sector. Savola et al. (2018) proposed perceived competitive pressure, legislation and media attention, and pressure from customers as the environmental factors in the adoption of AI in marketing management system. According to Jadhav (2021) among the three variables, mimetic and normative pressure not regulatory pressure for SME leaders influences AI adoption in Indian SMEs. Environmental factors such as dependence on external aid, higher price of an AI solution, in case of failure of technology, higher risk of losing reputation and customer base are the likely reasons for lack of AI adoption in SMEs. (Aarstad & Saidl, 2019). Ifinedo (2011) found that the Canadian government did not extend the support to internet adoption in SMEs. Similarly, partner pressure or customer pressure did not exert any influence on internet adoption. Nevertheless,

competition had positive and higher impact likely due to the need for survival which can push the organization to utilize new technology to gain power over their competitors.

Research conceptual framework

The technological, organizational and environmental (TOE) framework is a widely accepted model to study the adoption of technology in the organization. This framework consists of three key elements, namely, technological, organizational and environmental context that gives an insight to the influence of these contexts in the process of innovation, adoption and implementation of technology on an organization level (Baker, 2012). The TOE framework has been used in many empirical works to evaluate the technology adoption intention such as Cloud computing (Oliveira et al., 2014), E-commerce (Bagale, 2014), internet adoption (Ifinedo, 2011) and E-business (Wen & Chen, 2010). Besides these, the use of TOE framework alone or in integration with other theories like diffusion of innovation theory (DOI) (Alsheibani et al., 2018) or Task-Technology-Fit (TTF) framework (Pillai & Sivathanu, 2020) has been used to identify the factors influencing AI adoption in multiple disciplines like government authorities (Stenberg & Nilsson, 2020), IT/ITeS industry (Pillai & Sivathanu, 2020), telecom industry, SMEs (Kumar & Kalse, 2021) and so on.



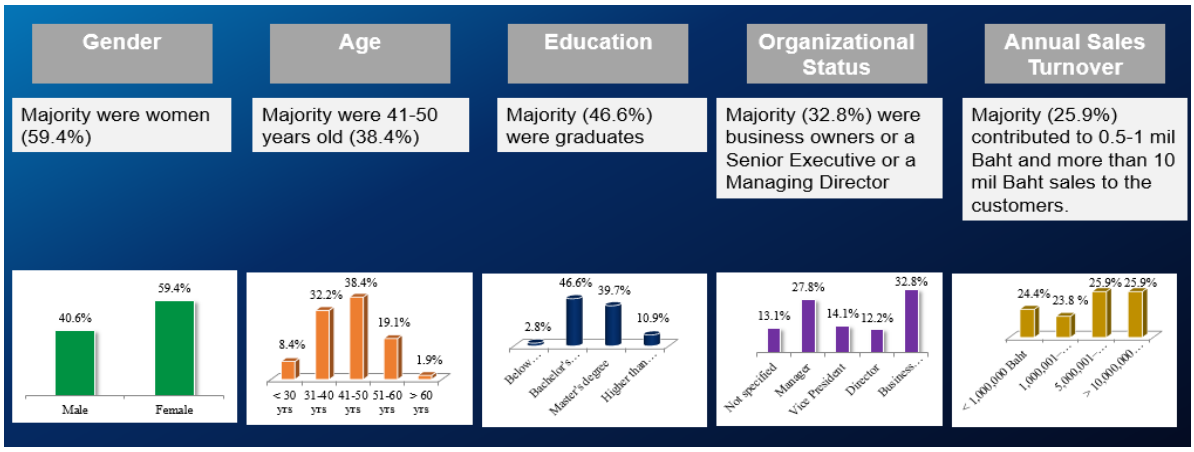
Research methodology

For this research technology-organization-environment (TOE) framework was adopted to understand the preparedness of Thai SMEs in the adoption of AI. The three key elements of TOE, namely, technological context, organization context and environmental context gives an insight to the influence of these contexts in the process of innovation, adoption and implementation of technology on an organization level (Baker, 2012). TOE framework alone

or in integration with other theories like diffusion of innovation theory (DOI) and Institutional Theory (INT) has been used in many empirical works related to adoption of technology, namely, ICT in multiple discipline including SMEs (Alsheibani et al., 2018; Truvé et al., 2019; Sastararuji et al., 2021). However, studies related to AI adoption by SME using the TOE framework were found to be limited in literature. To further explore the importance of marketing strategies, another component, namely, marketing mix was integrated into this framework.

Demographics

Out of 320 respondents, 59.4% (190/320) of respondents were female and the remaining was male. About 70% (226/320) of respondents were in the age range of 31-50 years and with Bachelor's (149/320; 46.6%) and Master's degree (127/320; 39.7%). In the context of occupation, the participants were mainly employed as business owner/senior executive/managing director (105/320, 32.8%) and earned an income of more than 5,000,001 Baht (50.1%).



Research results

The main aim of this study was to explore the influence of organizational context in the preparedness of SME in the adoption of AI. Large enterprises are already reaping the benefits of AI; however, there has been a considerable lack of adoption of AI in small and medium industries. Since SMEs are the economic backbone of many developing countries including Thailand, the present study is an attempt to identify the factors essential for the adoption of AI in SMEs. The findings of present study indicated a significant relationship between organizational context and the preparedness of SME in the adoption of AI. Further, this relation partially mediated the marketing mix.

Table *below shows the correlation between the study variables*

S.N.	Variables	Mean ($\bar{X}$)	SD.	1	2	3	4	5
1	Preparedness of the SMEs	4.02	1.01	1				
2	Technological Context	3.98	1.05	0.745**	1			
3	Organizational Context	3.95	1.08	0.789**	0.800**	1		
4	Environmental Context	3.59	0.88	0.658**	0.722**	0.721**	1	
5	Major Marketing Mix	3.92	1.10	0.835**	0.805**	0.802**	0.746**	1

- Looking at the technological context, participants were seen to largely agree that tech competence, relative advantage, and ease of use supports of AI-related marketing.

- The implication of this finding is that technological competence needs to be boosted through large scale training programs.
- The managements need to constantly ensure that AI-related supplies and equipment are easily accessible to the employees to enable smoother adoption.
- Looking at the organizational context, leadership and individual level of adoption, and system openness to accept new challenges were affirmed by the majority of the respondents.
- This implies the need for ensuring clear leadership and vision to overcome marketing challenges arising through AI. Organizations must very explicitly spell out their policies which must percolate throughout the organizations.
- Further, the need for having communication plans in place to make everyone aware in the company on how to use AI in marketing is key. Managements have to be open to accept new challenges and promote adoption of new technologies relevant to AI in marketing.

Recommendations

1. As SMEs have limited resources, they could initially adopt AI adoption on a small scale, followed by a slow expansion of technology.
2. Before investing in the AI tools, SMEs must evaluate both negative factors like data security concern, task complexity, PDPA, etc.
3. Prior to AI adoption, data should be consolidated, followed by identification of the AI tool required for the processing of collected data as AI is data driven.
4. AI integration can be used to resolve administrative issues like HR, accounting, finance and internal communication.
5. Sales, being crucial to SMEs, necessitates training of salesperson in different aspects of AI.
6. Top management with leadership qualities should be the first and foremost to accept the importance of technology.
7. Massive company-wide training to work alongside digital tools, on digital skills, fluency in data skills, etc. is suggested.
8. Talent acquisition involving sorting, selecting and hiring of talented individuals must be brought under the AI ambit.
9. Further, AI implementation will overcome the tedious work and enable allocation of human resources for more meaningful work.
10. As there is a fear of job loss, monitoring of workers' behaviour is necessary. The workforce needs to be educated regarding the benefits of technological skills.
11. Considering that AI technology has potential in many key areas, to make an informed decision about AI adoption, AI advisory committees must be created.
12. In Thai industry, the SME sector majorly contributes to GDP and employment. Therefore, suitable policies on AI adoption to enhance the sustainable development of SME must be worked on with government encouragement.
13. Since SMEs are crucial for Thai economy, public and private partnership must be encouraged. To boost economic development, the government must increase the financial investment in AI technology.
14. Regulatory bodies must oversee the maintenance of confidentiality and privacy of customer data.
15. Integrated AI tools can predict the requirements for the marketing. New market models must be created to promote the new products/pricing.
16. AI integration can help in the automation of non-routine tasks and re-organize the work

schedule (e.g., use of chatbot / voicebot to enhance communication with consumers).

References

Aarstad, A., & Saidl, M. (2019). Barriers to Adopting AI Technology in SMEs. A Multiple-Case Study on Perceived Barriers Discouraging Nordic Small and Medium-sized Enterprises to Adopt Artificial Intelligence-Based Solutions (Master's Thesis). Retrieved from https://research-api.cbs.dk/ws/portalfiles/portal/60704162/790410_Aarstad_Saidl_Barriers_to_Adopting_AI_Technology_in_SMEs.pdf

Alharbi, F., Atkins, A., & Stanier, C. (2016). Understanding the determinants of Cloud Computing adoption in Saudi healthcare organisations. Complex & Intelligent Systems, 2(3), 155-171.

Alsheibani, S., Cheung, Y., & Messom, C. (2018). Artificial Intelligence Adoption: AI-readiness at Firm-Level. In PACIS (p. 37).

Antlová, K. (2009). Motivation and barriers of ICT adaptation in small and medium-size enterprises. Retrieved from https://otik.uk.zcu.cz/bitstream/11025/17290/1/11_antlova.pdf

Bagale, G. S. (2014). Determinants of E-commerce in Indian MSME sector: a conceptual research model based on TOE framework. Universal Journal of Management, 2(3), 105-115.

Baker, J. (2012). The technology–organization–environment framework. Information systems theory, 231-245.

Caesar, A. E., Maayir, G., Osei-Agyemang, A., & Anaba, O. A. (2017). Marketing Mix Practices in the Development of Small and Medium Enterprises in the Bolgatanga Municipality, Ghana. International Journal of Management Sciences and Business Research, 12, 90-102.

Chalita, S. (2014). Demand for internet access and use of Small

Chetthamrongchai, P. & Jermsittiparsert, K. (2020). Entrepreneurial Orientation and the SMEs Performance in Thailand: The Mediating Role of Strategic Orientations. Journal of Security and Sustainability Issues, 9(M), 348-361.

Chienwattanasook, K. & Jermsittiparsert, K. (2019). Influence of Entrepreneurial Orientation and Total Quality Management on Organizational Performance of Pharmaceutical SMEs in Thailand with Moderating Role of Organizational Learning. Systematic Reviews in Pharmacy, 10(2), 223-233.

Chooprayoon, V. (2011). A study of factors influencing the adoption of E-Commerce technology in small and medium enterprises (SMES) in the kingdom of Thailand (Doctoral dissertation, Murdoch University).

Chooprayoon, V., & Fung, C. C. (2010). TECTAM: an approach to study Technology Acceptance Model (TAM) in gaining knowledge on the adoption and use of e-commerce/e-business technology among small and medium enterprises in Thailand. InTech, 31-38.

Chopra, V. (2019). How should US hospitals prepare for coronavirus disease 2019 (COVID-19)?

Damerji, H. (2020). Technology readiness impact on artificial intelligence technology adoption by accounting students (Doctoral dissertation, University of La Verne).

Depietro, R., Wiarda, E., & Fleischer, M. (1990). The context for change: Organization, technology and environment. The processes of technological innovation, 199(0), 151-175.

Hansen, E. B., & Bøgh, S. (2021). Artificial intelligence and internet of things in small and

medium-sized enterprises: A survey. Journal of Manufacturing Systems, 58, 362-372.
Huang, M. H., & Rust, R. T. (2021). A strategic framework for artificial intelligence in marketing. Journal of the Academy of Marketing Science, 49(1), 30-50.
Ifinedo, P. (2011). An empirical analysis of factors influencing Internet/e-business technologies adoption by SMEs in Canada. International Journal of Information Technology & Decision Making, 10(04), 731-766.
Jadhav, D. S. (2021). Understanding Artificial Intelligence Adoption, Implementation, and Use in Small and Medium Enterprises in India. (Doctoral Thesis),
Jarek, K., & Mazurek, G. (2019). MARKETING AND ARTIFICIAL INTELLIGENCE. Central European Business Review, 8(2).
Kijsanayotin, B., Pannarunothai, S., & Speedie, S. M. (2009). Factors influencing health information technology adoption in Thailand's community health centers: Applying the UTAUT model. International journal of medical informatics, 78(6), 404-416.
Kumar, A., & Kalse, A. (2021). Usage and adoption of artificial intelligence in SMEs. Materials Today: Proceedings. 10.1016/j.matpr.2021.01.595.
Lin, C. H., Shih, H. Y., Sher, P. J., & Wang, Y. L. (2005, July). Consumer adoption of e-service: Integrating technology readiness with the technology acceptance model. In A Unifying Discipline for Melting the Boundaries Technology Management: (pp. 483-488). IEEE.
Londhe, B.R. (2014) Marketing mix for next generation marketing
Lundberg, E., & Åkesson, C. (2015). Cloud Computing-Factors that affect an adoption of cloud computing in traditional Swedish banks.
Nugroho, M. A., Susilo, A. Z., Fajar, M. A., & Rahmawati, D. (2017). Exploratory study of SMEs technology adoption readiness factors. Procedia Computer Science, 124, 329-336.
Oliveira, T., Thomas, M., & Espadanal, M. (2014). Assessing the determinants of cloud computing adoption: An analysis of the manufacturing and services sectors. Information & Management, 51(5), 497-510.
Parasuraman, A. (2000). Technology Readiness Index (TRI) a multiple-item scale to measure readiness to embrace new technologies. Journal of service research, 2(4), 307-320.
Parasuraman, A., & Colby, C. L. (2001). Techno-ready marketing: How and why your customers adopt technology (p. 224). New York: Free Press.
Phonthanukitithaworn, C., Sellitto, C., & Fong, M. W. L. (2015). User intentions to adopt mobile payment services: A study of early adopters in Thailand. Journal of Internet Banking and Commerce, 20(1).
Pillai, R., & Sivathanu, B. (2020). Adoption of artificial intelligence (AI) for talent acquisition in IT/ITeS organizations. Benchmarking: An International Journal, 27 (9), 2599-2629.
Puriwat, W., & Tripopsakul, S. (2017). The impact of e-service quality on customer satisfaction and loyalty in mobile banking usage: Case study of Thailand. Polish Journal of Management Studies, 15.
Rahman, N. A., Yaacob, Z., & Radzi, R. M. (2016). An overview of technological innovation on SME survival: a conceptual paper. Procedia-Social and Behavioral Sciences, 224, 508-515.
Rao, T. (2017). Factors critical to the organisational adoption of artificial intelligence: a South African perspective (Doctoral dissertation, University of Pretoria).
Roose, K. (2019). The hidden automation agenda of the Davos elite. New York Times, 25.
Saengchaia, S., Pattanapongthornb, J., & Jermsittiparsertc, K. (2019). The Role of Subjective Norms on the Adoption of Information and Communication Technology in Health Care in Thailand. International Journal of Innovation, Creativity and Change, 8(8), 256-276.
Sakolnakorn, T. P. N. (2010). The Analysis Of Problem And Threat Of Small And Medium-

Sized Enterprizes In Northeast Thailand. International Business & Economics Research Journal (IBER), 9(9).

Sandkuhl, K. (2019). Putting AI into Context-Method Support for the Introduction of Artificial Intelligence into Organizations

Savola, T., Tuohimaa, T., & Berg, S. (2018). AI-Enhanced Marketing Management–Factors Influencing Adoption in SMEs. (Bachelor Thesis). Retrieved from https://www.diva-portal.org/smash/get/diva2:1214318/FULLTEXT01.pdf

Singh, G., Gaur, L., & Ramakrishnan, R. (2017). Internet of Things—Technology adoption model in India. Pertanika J. Sci. Technol, 25(3), 835-846.

Sirirak, S., & Islam, N. (2010, July). Relationship between information and communication technology (ICT) adoption and hotel productivity: An empirical study of the hotels in Phuket, Thailand. In Picmet 2010 Technology Management for Global Economic Growth (pp. 1-9). IEEE.

Sriphaiboon, R., & Somjai, S. (2019). Potential development guideline of Thai SMEs entrepreneurs. International Academic Research Conference in Yunnan, (pp 100-103).

Stenberg, L., & Nilsson, S. (2020). Factors influencing readiness of adopting AI: A qualitative study of how the TOE framework applies to AI adoption in governmental authorities. (Master Thesis). https://www.diva-portal.org/smash/get/diva2:1460888/FULLTEXT01.pdf

Suebsin, C., & Gerdsri, N. (2010, July). Technology adoption: A case study of ERP implementation in one of healthcare organizations in Thailand. In PICMET 2010 Technology management for global economic growth (pp. 1-8). IEEE.

Truvé, T., Wallin, M., & Ryfors, D. (2019). Swedish manufacturing SMEs readiness for industry 4.0: what factors influence an implementation of artificial intelligence and how ready are manufacturing SMEs in Sweden? (Bachelor Thesis). Retrieved from https://www.diva-portal.org/smash/get/diva2:1321698/fulltext01.pdf

Watney, C., & Auer, D. (2021). Encouraging AI adoption by EU SMEs. https://laweconcenter.org/wp-content/uploads/2021/04/PPI_Encouraging-AI-adoption-by-EU-SMEs-3.24.21-2.pdf

Wen, K. W., & Chen, Y. (2010). E-business value creation in Small and Medium Enterprises: a US study using the TOE framework. International Journal of Electronic Business, 8(1), 80-100.

Wieland, J. (2018). SME Marketing mix standardization in the B2B market. Journal of Management Policy and Practice, 19(1), 45-55.

Zhu, Y., Li, Y., Wang, W., & Chen, J. (2010). What leads to post-implementation success of ERP? An empirical study of the Chinese retail industry. International Journal of Information Management, 30(3), 265-276.