DEVELOPMENT OF EFFECTIVE ARTIFICIAL INTELLIGENCE IMPLEMENTATION BASIC MODEL FOR ELDERLY CARE SERVICES

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ABSTRACT
This article aims to study the basic model for applying artificial intelligence in the elderly care business in Thailand. This study examined literature from research articles, academic articles, books, and electronic data. The results revealed that the following key factors were identified: 1) information perception, 2) service quality, 3) decision-making, 4) AI, and 5) elderly care business. AI can help classify and weigh these factors accurately, which will be beneficial to service providers and elderly families in deciding on appropriate and qualified service providers. This conceptual model can be applied for empirical testing in future elderly care businesses.
Keywords: AI, Impact, Decision-making, Elderly Care Business

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INTRODUCTION

The world's population is currently entering an aging society rapidly. According to data from the United Nations (United Nations, 2021), it is estimated that in 2030, the world's population will be aged 65 and will account for 22% of the total population. Thailand is also entering an aging society. In 2030, the Thai population aged 65 and over will account for 20.6% of the total population. Changing population structures are both opportunities and challenges for businesses. Businesses that can adapt and effectively meet the needs of the elderly will benefit from the growing elderly market, while businesses that cannot adapt may lose business opportunities. Artificial Intelligence (AI) is a technology with the potential to help businesses adapt to an aging society. Artificial intelligence can be applied in various aspects of the elderly business, such as healthcare, elderly housing, products and services for the elderly, marketing and sales. Product development on the platform focuses primarily on product design and development issues (Andersen et al., 2023), allowing companies to adapt their MO to improve the efficiency of new products. (Taghvaee & Talebi, 2023) This section discusses the benefits of AI in creating a competitive advantage in the elderly business. It will focus on the main issues, examples of applying artificial intelligence in the elderly business, challenges in applying artificial intelligence in the elderly business, benefits of artificial intelligence in creating a competitive advantage in the elderly business, artificial intelligence is useful in creating a competitive advantage in the elderly business in many ways, as follows: Increase operational efficiency. Artificial intelligence can help businesses increase operational efficiency, such as increasing efficiency in caring for the elderly, increasing efficiency in providing customer service, and increasing efficiency in managing various resources. Developed through the interaction between resources and the company's competitive capabilities and helping to achieve goals, targets and objectives. (Kanthawong et al., 2023) Develop new products and services. Artificial intelligence can help businesses develop new products and services that can meet the needs of the elderly, such as health products and services, entertainment products and services, and mental health care products and services. Create better customer experience. Artificial intelligence can help businesses create better customer experience, such as providing appropriate advice and information to the elderly, and interacting with the elderly effectively. Examples of applying artificial intelligence in the elderly business Currently, AI is being used in various forms of the elderly business, such as healthcare. Artificial intelligence can be used in telehealth check-ups, health consultations, and advice on nursing home treatment for the elderly. Artificial intelligence can be used to care for the safety of the elderly and manage various facility systems. Management of various activities, products and services for the elderly. The use of robots in retail, healthcare, service and logistics businesses to assist human labor. (Rajan et al., 2022), Artificial intelligence can be used to develop new products and services, such as mobility aids, daily living aids, and online elderly care services. Marketing and sales: Artificial intelligence can be used to analyze customer data, conduct targeted marketing, and offer products and services that are appropriate to customer needs. Challenges in applying Artificial Intelligence to the elderly business the application of Artificial Intelligence to the elderly business also faces several challenges, such as: Complexity of technology Artificial intelligence is a complex technology that requires specialized knowledge and skills to apply Cost The application of Artificial Intelligence to business can be expensive. Security concerns

There may be security and privacy risks in using Artificial Intelligence. Appropriate adaptation and application of Artificial Intelligence will help businesses create a competitive advantage and succeed in the elderly business. Assessing the direct benefits and impacts on key stakeholders who benefit or are directly affected by running a housing business that targets the elderly. (Rungrotkankul et al., 2023) This research aims to study how the model and application of AI in the elderly care business influences consumers' decision-making in choosing an

elderly care center. Various factors will be considered, including service quality, perception data, and decision-making processes. The findings can be used to develop and improve services that better meet the needs of the elderly

LITERATURE REVIEWS

Table 1 Show research synthesis selection process for inclusive exclusive list of articles

Attribute	Source	Components
Perception information		
Perception	(Lindeza et al., 2024)	The changes in the information of the elderly service providers cause them to lack important information.
Data transmission	(Ramdowar et al., 2024)	The delivery of information affects the perception of the elderly to understand more.
Verification	(Zhang & Yang, 2024)	The examination of the elderly's perception of information.
Perception	(Costanzo et al., 2024)	Perception and expectation affect the elderly.
Data perception	(Diao et al., 2024)	Perception requires technology.
Perception	(Seale et al., 2024)	Survey of community leader perception.
Data	(Batzler et al., 2024)	Knowledge and perception of information.
Perception	(Wang et al., 2024)	Perception of the source of information.
Service quality		
Service quality	(Zhao & Li, 2024a)	Service quality is reliable
Service quality	(Sogbe et al., 2024)	Service quality and satisfaction
Service delivery	(Rauf et al., 2024)	Interest in service survey
Service delivery	(Guo et al., 2024)	Maintaining and improving service quality
Decision		
Decision Making	(Kanbay et al., 2024)	Treatment decision-making inspection
Decision Making	(Martora et al., 2024)	Treatment decision-making for elderly patients
Decision Making	(De Simone et al., 2024)	Need for a decision-making agent
Artificial intelligence		
Artificial intelligence	(Zhao & Li, 2024b)	Integration of artificial intelligence into elderly care services in society
Artificial intelligence	(Pacchiano et al., 2024)	Artificial intelligence to help categorize, diagnose and guide patients
Artificial intelligence	(Park et al., 2024)	AI-driven video monitoring for elderly care
Artificial intelligence	(Mhlanga, 2024)	Advances in artificial intelligence for the elderly
Artificial intelligence	(Ghosh, 2024)	Potential applications of AI-based systems for the elderly
Artificial intelligence robots	(Ghazanchyan et al., 2024)	Robots may become essential to meet the needs of the elderly
Elderly care business		

Attribute	Source	Components
Elderly Care	(Ubfal, 2024)	Constraints affecting business decisions, such as the cost of services and products related to elderly care
Elderly Care Business	(Zhao & Li, 2024c)	Elderly care is a formidable task. Current landscape of elderly care and nursing homes
Elderly Care	(Sulintang et al., 2024)	The number of elderly people will lead to an increase in the demand for elderly care
Elderly Assistance	(Mushtaq et al., 2024)	Focus on technologies that can help the elderly

(*Lindeza et al., 2024), (Ramdowar et al., 2024), (Zhang & Yang, 2024), (Costanzo et al., 2024), (Diao et al., 2024), (Seale et al., 2024), (Batzler et al., 2024), (Wang et al., 2024), (Zhao & Li, 2024a), (Sogbe et al., 2024), (Rauf et al., 2024), (Guo et al., 2024),(Kanbay et al., 2024), (Martora et al., 2024), (De Simone et al., 2024), (Zhao & Li, 2024b), (Pacchiano et al., 2024), (Park et al., 2024), (Mhlanga, 2024), (Ghosh, 2024), (Ghazanchyan et al., 2024), (Ubfal, 2024), (Zhao & Li, 2024c), (Sulintang et al., 2024), (Mushtaq et al., 2024)*

In summary, from the review of relevant research literature, the following issues were found: First, most research is a combination of quantitative and qualitative research, and very little is used in structural equation analysis (Structural Modeling Equation: SEM). Second, most research is conducted abroad, while there is still very little in Thailand. This is the origin of the research on the influence of artificial intelligence on the decision to choose an elderly care service provider.

Table 2 the latent and observed variables are summarized from the conceptual framework as shown in the figure above as follows

Latent variables Observed variables	Latent variables Observed variables
Perception Information	variety, knowledge attitude, benefit
Service Quality	process, people, quality, management
Decision	data, assessment, decision, quality
Artificial Intelligence	data, check, reliability, efficiency
Elderly care business	service, price, security, environment

Artificial Intelligence

Machine Learning Theory is the basis for developing AI systems that can learn and improve their performance from data. It is divided into supervised learning, unsupervised learning, and reinforcement learning (Mitchell, 1997; Alpaydin, 2020).

Natural Language Processing Theory studies the processing and understanding of human language by computers, covering word separation, word classification, grammatical analysis, and meaning understanding (Jurafsky & Martin, 2021).

Deep Learning research, such as the research of Hinton et al. (2012), which presented deep learning with convolutional neural networks to process visual and audio data.

Intelligent Assistants research, such as the work of Kaplan et al. (2020), which developed an automated system for advanced conversations and content writing.

Perception Information

Effort Expectancy Theory explains that the perceived ease of use of technology affects the intention to use that technology (Venkatesh et al., 2003).

Technology Acceptance Model states that perceived usefulness and perceived ease of use are important factors affecting technology acceptance (Davis, 1989).
Hsieh et al.'s (2008) research found that information quality, system quality, and service quality are factors that influence the use of information systems.
Wixom and Todd's (2005) research stated that information value and perceived value are positive factors affecting the intention to use information technology.
The Theory of Planned Behavior explains that attitudes, group norms, and perceived behavioral control are factors affecting the intention and behavior to use technology (Ajzen, 1991).
Information acquisition is not only a process of learning information, but also a process that requires exploration, analysis, and critical thinking in order to understand and respond to what is happening in the world around us effectively and responsibly to the information we receive and what we need to know in our daily lives. Technology acceptance is the acceptance of change, with learning new things and adapting to new things being an important part of the technology acceptance process (Davis, 1989).

Decision Making

Rational Choice Theory explains that humans make decisions based on the highest costs and benefits to achieve their desired objectives (Becker, 1976).
Kahneman and Tversky's Prospect Theory (1979) explains that human decision-making is influenced by psychological biases, such as risk assessment deviations.
Gigerenzer and Goldstein's (1996) research presents a simple decision-making theory (Take-the-Best Heuristic), which is a method of decision-making using limited information.
Thaler and Sunstein's (2008) research on decision support (Choice Architecture) by structuring situations and choices to help decision-makers make the best choice.
Multi-Criteria Decision Making is a decision-making framework that requires consideration of multiple criteria, such as AHP and TOPSIS techniques (Triantaphyllou, 2000).

Service Quality

Parasuraman et al.'s (1988) Service Quality Theory proposes the concept of the Service Quality Gap and five dimensions of service quality as the basis of the SERVQUAL tool.
Social Exchange Theory explains that the relationship between service providers and service recipients depends on the exchange of benefits (Cropanzano & Mitchell, 2005).
Bitner et al.'s (1990) research presents a model of organizational service quality, identifying factors that affect the quality of service that customers receive.
Heskett et al.'s (1994) research proposes the concept of service equations through the relationship between employee satisfaction, service quality, and customer satisfaction.
Cronin and Taylor's (1992) SERVPERF service quality management theory proposes to evaluate service quality only from customer perceptions, without comparing it with expectations.
From the literature review to synthesize elements and observable variables, the conceptual framework and research hypothesis on artificial intelligence, causal factors, and influence on the decision to choose a service provider for the elderly care business can be shown as shown in the following figure.

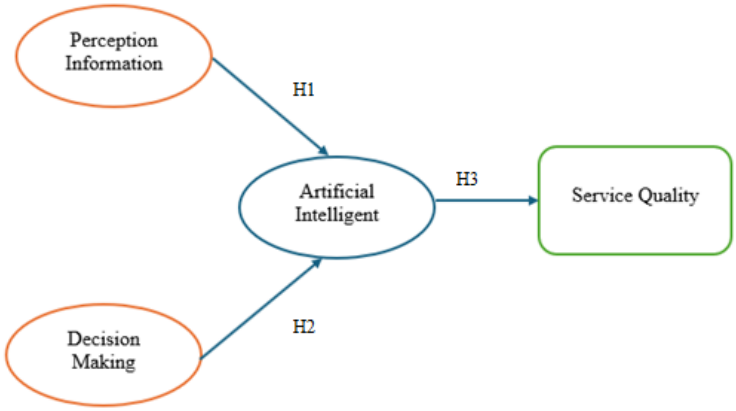

Figure 1 Research conceptual framework Artificial intelligence, causal factors influencing the decision to choose the service provider of the elderly care business, which comes from the review of literature, concepts, theories and related research and synthesized into a research conceptual framework.

RESEARCH METHODOLOGY

This study adopts a documentary research approach to examine the foundational model for applying artificial intelligence (AI) in elderly care services in Thailand. Without relying on a specific population or sample group, the research synthesizes academic literature, policy documents, and empirical studies from credible sources. Key components such as decision-making systems, service quality, staff competency, and technological infrastructure were analyzed. A conceptual model was then developed to reflect global best practices and Thai-specific contexts. The model was validated through comparative review with international frameworks. This methodology provides a structured foundation for future research and policy advancement.

RESEARCH RESULTS

This study explores the application of artificial intelligence (AI) in selecting elderly care providers, identifying five key components: perception information, service quality, decision-making, AI technology, and elderly care business. These elements are grounded in theoretical models such as the Technology Acceptance Model, Rational Choice Theory, and SERVQUAL. AI plays a growing role in enhancing decision-making through machine learning, natural language processing, and intelligent systems. The research proposes a framework that links causal relationships among these factors using structural equation modeling (SEM), a method rarely applied in this context. The study contributes significantly to bridging academic gaps in Thailand's elderly care sector.

DISCUSSION & CONCLUSION

This study proposes a conceptual framework for applying artificial intelligence (AI) to support decision-making in selecting elderly care facilities. AI systems can systematically analyze key factors such as service quality, safety, environment, and staff expertise, helping families make more informed choices. The integration of AI in elderly care reflects a growing trend toward enhancing service efficiency and improving quality of life. Research by Alharthi et al. (2023) emphasizes AI's role in processing service-related data, while Zhang et al. (2022) highlights the use of AI and IoT to optimize care delivery. A mixed-methods approach is recommended, combining quantitative analysis using structural equation modeling (SEM) to examine causal relationships, and qualitative methods such as interviews to enrich understanding. Lee and Kim (2021) further support this by analyzing AI's impact on service quality and staff competence.

Together, these insights contribute to a comprehensive model for effective AI implementation in Thailand's elderly care sector.

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