Asian Administration and Management Review

Original Research Article

Received: 25 March 2024 **Revised:** 24 July 2024 **Accepted:** 24 July 2024

FACTORS AFFECTING THE ACCEPTANCE OF ARTIFICIAL INTELLIGENCE IN ELECTRONIC COMMERCE

Kanokwan KANCHANATANEE[1]

1 Faculty of Management Sciences, Yala Rajabhat University, Thailand; kanokwan.k@yru.ac.th

Handling Editor:
Professor Dr.Wing-Keung WONG Asia University, Taiwan
(This article belongs to the Theme 1: Business Performance, Competitiveness, and Sustainability)

Reviewers:
1) Professor Dr.Chanathat BOONRATTANAKITTIBHUMI EIU, France
2) Associate Professor Dr.Banpot WIROONRATCH PSU, Thailand
3) Associate Professor Dr.Theerawat HUNGSAPRUEK PSU, Thailand

Abstract

Business entrepreneurs who want to expand their business and distribution channels to support the growth of electronic commerce should understand the factors affecting the acceptance of artificial intelligence in electronic commerce. The purpose of this paper is to identify the factors that affect the acceptance of artificial intelligence in electronic commerce. These factors can be examined according to the guidelines of the technology acceptance model, which includes thirteen elements: perceived usefulness, perceived ease of use, trust, subjective norm, compensation, experience, perceived value, technical complexity, enjoyment, perceived risk, perceived innovativeness, perceived information quality, and perceived customization. Three factors may act as mediator variables: perceived usefulness, perceived ease of use, and perceived value. This is because using artificial intelligence to support customers in buying products online can enhance their shopping experience and satisfaction. Business entrepreneurs can leverage these factors to adjust their service strategies, using artificial intelligence as a tool to support e-commerce in various contexts and for different populations.

Keywords: Artificial Intelligence, Technology Acceptance Model, E-Commerce

Citation Information: Kanchanatanee, K. (2024). Factors Affecting the Acceptance of Artificial Intelligence in Electronic Commerce. *Asian Administration and Management Review, 7*(2), 101-108. https://doi.org/10.14456/aamr.2024.26

Introduction

Artificial intelligence is a crucial technology driving the growth of electronic commerce, especially given the rapid market expansion since the outbreak of COVID-19. Electronic commerce entrepreneurs are striving to broaden their business and distribution channels, and as a result, have integrated artificial intelligence to deliver comprehensive services and enhance customer satisfaction and experience (Thamma et al., 2024). According to HardcoreCEO (2021), artificial intelligence in electronic commerce encompasses six key characteristics: Smart Chatbots: These assist in customer interactions by answering questions in a structured manner, providing useful advice, and offering initial solutions. Augmented Reality (AR): AR allows customers to view products virtually, choose colors, and rotate the product to see it from different angles, aiding purchase decisions without needing to see the actual product. Visual Searching: Customers can upload images to identify products and find similar items in the store. Facial Recognition: AI learns a customer's facial features and recommends suitable products. Smart Product Recommendations: AI analyzes customer behavior and demographic data to suggest products of interest on websites or social networks. Smart Inventory Management: AI manages inventory from order processing to completion, recommending appropriate stock levels for sales plans.

While most customers appreciate and accept AI in electronic commerce, a few remain hesitant due to unfamiliarity, concerns about personal information, or security issues (Wang et al., 2023). Business entrepreneurs need to understand these reasons to improve their service offerings, helping these customer groups embrace AI and enjoy a positive shopping experience. E-commerce involves trading or exchanging goods through online systems, using the Internet as an intermediary. This includes accessing store websites via computers and using mobile devices like tablets or smartphones to access store applications. Most internet users have experience buying or selling products online (Thamma et al., 2023). In this article, we focus on online purchases to ensure clarity and consistency in the presented information.

Using Technology Acceptance Models to explain the factors affecting the acceptance of artificial intelligence in online shopping is still relevant, even though The Technology Acceptance Model has been in use since 1986 (Davis, 1986). The study by Al-Emran & Granić (2021) demonstrates that the technology acceptance model is still applied to emerging technologies today and remains popular. Models continue to evolve and expand as new technologies are developed. The Technology Acceptance Model has been applied to a variety of emerging technologies, and electronic commerce studies are still at the forefront of model acceptance.

Literature Review

Technology Acceptance Model (TAM)

Davis (1989) developed the Technology Acceptance Model (TAM) based on the Theory of Reasoned Action (TRA). The model's underpinning logic was that in the context of technology utilization, behavioral intention was not shaped by a generic attitude toward behavioral intention, but specific beliefs related to technology use. The goal of TAM was to become the framework for examining a wide range of behaviors of technology users while maintaining a parsimonious approach. The primary objective of TAM was to shed light on the processes underpinning the acceptance of technology, to predict the behavior of and provide a theoretical explanation for the successful implementation of technology. The practical objective of TAM was to inform practitioners about measures that they might take prior to the implementation of systems. To fulfil the objectives of the theory, several steps were carried out. Davis embarked on the development of the model of technology acceptance by framing the processes mediating the relationship between IS characteristics (external factors) and actual system use. The Theory of Reasoned Action, which provided a psychological perspective on human behavior and was

missing in the IS literature at that time. TAM has three components including Perceived ease of use, Perceived usefulness and Attitude toward using. Both Perceived ease of use and Perceived usefulness influence Behavior Intention through Attitude toward using. In addition, Perceived usefulness also has a direct influence on Behavior Intention and Behavior Intention also influences Actual use.

Artificial Intelligence (AI)

Artificial intelligence is based on algorithms designed to imitate human thinking. The principles of artificial intelligence involve interactive learning and computer learning, which includes pattern recognition, probability theory, statistics and data mining. Artificial intelligence is widely used in various fields. Artificial intelligence aims to extend human intelligence and can work as the human brain. Artificial intelligence also involves biology, medicine, linguistics, and other fields. The growth of Artificial intelligence and computer technology are significantly related to economic and social progress. The application of artificial intelligence in the economy is therefore becoming more widespread because of the development of modern science and technology. It affects the daily life and work of humans. In particular, the application of artificial intelligence in electronic commerce gives businesses a competitive advantage and becomes a driving force that aligns with business needs to support business operations and support customer service to get a better shopping experience (Wang et al., 2023). Artificial intelligence in this study classified as six key characteristics including Smart Chabot, Augmented Reality (AR), Visual Searching, Facial Recognition, Smart Product Recommendations and Smart Inventory Management HardcoreCEO (2021).

Electronic Commerce (E-Commerce)

Electronic commerce refers to the use of the internet and contemporary communication technology to exchange information required for business operations such as marketing, logistics, electronic payments, distribution. and customer relationship management. The main technological foundations of electronic commerce include electronic data interchange (EDI), intranet, internet, extranet, database, electronic mail, website development and mobile applications (Wang et al., 2023) Electronic commerce is the activity of buying, selling or exchanging goods and all commercial transactions online using the internet as a medium of connection. This includes using computers to access websites and mobile devices such as tablets or smartphones to access mobile application. Therefore, most internet users have had experience in buying or selling products online (Thamma et al., 2023).

Research Methodology

A systematic literature review was followed to select relevant publications on the acceptance of artificial intelligence in electronic commerce. A systematic literature review assists in identifying the body of knowledge in a field, which is an important step in advancing research. A systematic literature review can contribute by developing a model or conceptual framework Therefore, this study contributes to theory by developing a model of the factors affecting acceptance of artificial intelligence in e-commerce. This study used three electronic academic databases which included ScienceDirect, SpringerLink and Google Scholar. These three electronic academic databases were chosen as they provide results from a diverse collection of academic journals and provide the researcher with the ability to apply various filters to the searches to refine them for specific results. Google Scholar was chosen as it broadened the search to more than just specific database. The searches were conducted between February and March 2024 which papers were published between the years 2020 and 2024 were searched. The range 2020-2024 was chosen as this paper aims to refer to the most current literature on the topic. Searches included the terms artificial intelligence acceptance in electronic commerce, AI acceptance in electronic commerce, artificial intelligence acceptance in e-commerce, AI acceptance in e-commerce.

The inclusion criteria of this study considered papers published in English, which are peer-reviewed and were published between 2020 and 2024 in three electronic databases (ScienceDirect, SpringerLink and Google Scholar), and excluded papers published before 2020. Books, editorials, letters, news articles, and non-peer reviewed articles were excluded from this study. The researchers try to reduce bias that is available in the research by accepting it as part of increasing trustworthiness and authenticity which are measures of rigor in the studies. This study identified and engaged in review design bias, location bias, selection bias and synthesis bias. Review design bias was addressed by ensuring that a clearly defined, structured and objective research question was developed before engaging with the academic databases. Location bias was addressed by limiting the search to only papers written in English and only peer-reviewed articles. Multiple, relevant databases were searched to ensure a wide range of literature was located and available for use. Selection bias was addressed by ensuring that this paper is peer-reviewed to ensure that the content has not been limited to the understanding of any single author alone. Synthesis bias was corrected by ensuring that the specified arrangement was used. It considers all types of statistics, methods, samples, and sample sizes. All results were considered various types of findings. It increases the argument of the research question to solve all dimension of the question.

Approximately 17,765 studies in total were returned from searches on all three databases (554 studies for ScienceDirect, 811 studies for SpringerLink and 16,400 studies for Google Scholar). However, 17,765 includes overlaps where most searches returned duplicates from other searches and thus the 17,765 total is not an accurate amount, rather it is a rough estimation. From these results, researchers removed the duplicates papers. Once the duplicates were removed, if more than two of the keywords existed in the title, the study remained for the time being to not unnecessarily exclude studies based only on the title and not the contents. Then the abstracts of the remaining were reviewed and those that did not mention either artificial intelligence acceptance or electronic commerce in the abstract were excluded. This was done to ensure that the full-text articles could be evaluated for relevant information and to not exclude any relevant studies due to selection bias. After this evaluation, 12 final records were found to include research based on the factors affecting the acceptance of artificial intelligence in electronic commerce.

Results

To the results synthesized by a systematic literature review, we discuss thirteen factors that affect the acceptance of artificial intelligence in electronic commerce according to the guidelines of the technology acceptance model. The definitions of each factor are as follow:

1) Perceived Usefulness (PU): The perception that artificial intelligence enhances online shopping experience (Davis, 1989).

2) Perceived Ease of Use (PEU): The belief that artificial intelligence is easy to use without requiring advanced computer knowledge or skills (Davis, 1989).

3) Trust (TR): Confidence that artificial intelligence is safe and effective in meeting purchasing needs (Singh et al., 2024).

4) Subjective Norm (SN): The perception that influential people believe artificial intelligence should be used to assist in online purchases (Nagy & Hajdú, 2021).

5) Compensation Purchasing Capacity (COMP): The belief that customers can afford the products recommended by artificial intelligence (Nagy & Hajdú, 2021).

6) Experience (EXP): Knowledge and prior experience with artificial intelligence (Nagy & Hajdú, 2021).

7) Perceived Value (PV): The belief that using artificial intelligence is worthwhile compared to the effort or time spent (Chhikara et al., 2022).

8) Technicality (TECH): The belief that artificial intelligence is free of technical complexity and can be used without high costs (Chhikara et al., 2022).
9) Enjoyment (ENJ): Happiness in using artificial intelligence for online shopping and motivation to continue using it (Chhikara et al., 2022).
10) Perceive Risk (PR): The perception that using artificial intelligence for online shopping involves risks, including security, psychological, social, time, and performance risks (Chhikara et al., 2022).
11) Perceived Innovativeness (PI): The belief that artificial intelligence innovations provide real value for online purchases (Goli et al., 2023).
12) Perceived Information Quality (PIQ) the perception that the information obtained from artificial intelligence is high-quality and helpful for online purchases (Goli et al., 2023).
13) Perceived Customization (PC): The feeling that artificial intelligence allows quick access to needed information and can be customized to meet individual needs (Goli et al., 2023).
The key factors findings are perceived usefulness, perceived ease of use, trust, subjective norm, compensation, experience, perceived value, technical complexity, enjoyment, perceived risk, perceived innovativeness, perceived information quality, and perceived customization. Three factors may act as mediator variables: perceived usefulness, perceived ease of use, and perceived value. The factors and relations that are found to contribute significant and valuable understanding were used to generate the model that will provide comprehensive answers to the research purpose.as shown in Figure 1 below:

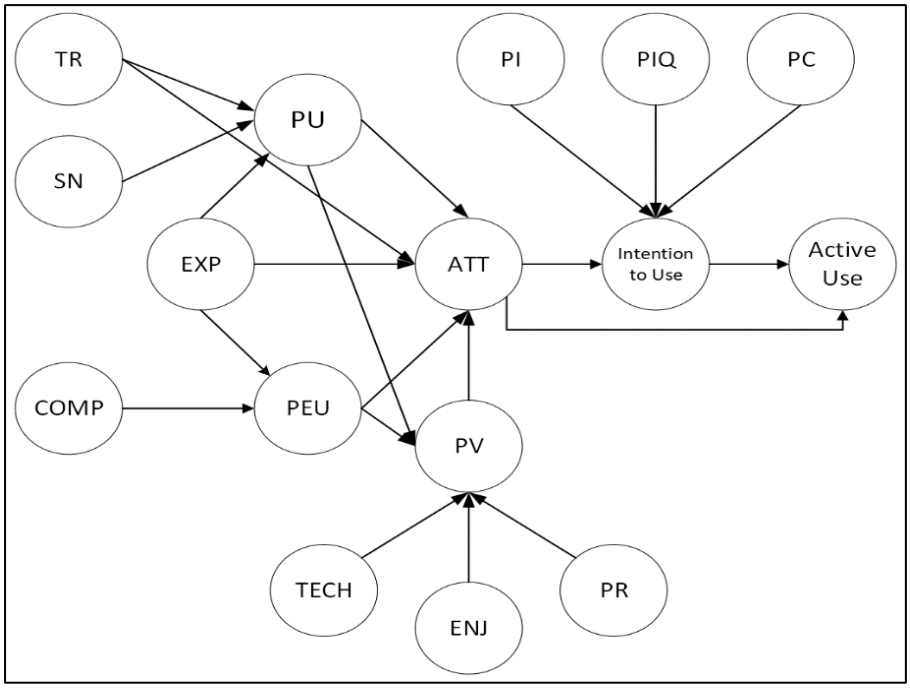

Figure 1 The Acceptance of Artificial Intelligence in Electronic Commerce Model

The findings of this study show that trust, subjective norms and experience have an effect to perceived usefulness. experience and compensation influence perceived ease of use. Technical complexity, enjoyment, perceived risk, perceived usefulness and perceived ease of use influence perceived value. Experience, perceived usefulness, perceived ease of use trust and perceived value influence attitudes toward use. Furthermore, perceived innovativeness, perceived information quality, perceived customization and attitudes toward use have an effect to intention to use. Lastly, attitudes toward use and intention to use have an effect to the actual use of artificial intelligence in electronic commerce.

The model of the acceptance of artificial intelligence in electronic commerce that three factors may act as mediator variables: perceived usefulness, perceived ease of use, and perceived value as shown in Figure 2

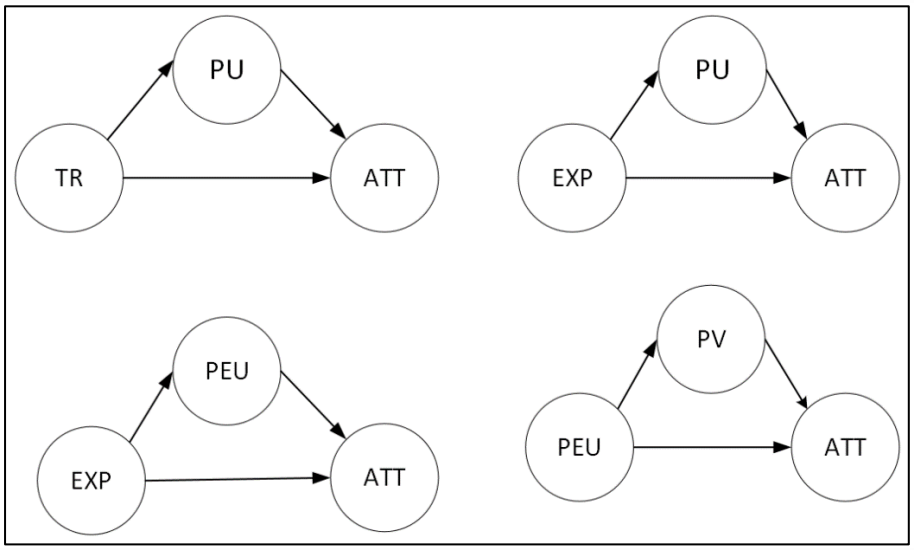

Figure 2 Factors may act as mediator variables

A mediator variable refers to a variable that intervenes between the independent variable (X) and the dependent variable (Y), creating a connection between X and Y. This implies that X may not directly impact Y significantly, but upon analysis, a significant indirect effect is observed. Once these factors are identified, the data must be reanalyzed to determine whether the intermediate variable fully mediates the relationship. It can be concluded whether the independent variable (X) directly influences the dependent variable (Y) or if the effect is primarily through the intermediate variable (Piriyakul, 2015).

The findings of this study show that perceived usefulness may act as mediator between trust and attitudes toward use. Similarly, perceived usefulness may act as mediator between experience and attitudes toward use. Furthermore, perceived ease of use may act as mediator between experience and attitudes toward use. Lastly, perceived value may act as mediator between perceived ease of use and attitudes toward use.

Conclusion

This paper is purposed to identify the factors that affect the acceptance of artificial intelligence in electronic commerce. This was done by systematic literature review method and analyzed papers relevant literature on the topic from three academic journal databases (SpringerLink, ScienceDirect and Google Scholar). Through this process, thirteen factors affecting the acceptance of artificial intelligence in electronic commerce were found in the literature including perceived usefulness, perceived ease of use, trust, subjective norm, compensation, experience, perceived value, technical complexity, enjoyment, perceive risk, perceived innovativeness, perceived information quality, and perceived customization. Three factors may act as mediator variables including perceived usefulness, perceived ease of use and perceived value.

The limitations mentioned in this study include the number of databases used, the duration of the investigation, the number of studies, the language employed, and the timeframe in which the studies were chosen. Due to time constraints, only three databases were chosen to search for relevant literature, and as a result, further relevant material that could have been useful in this study may have been excluded. Having access to more databases could have increased the

number of included studies, resulting in more relevant and complete findings. Another constraint is the range of 2020-2024, during which the literature was collected. This timeframe was chosen to include the most recent and relevant literature on the subject. Similarly, the inclusion criteria confined the searches to items published in English and eliminated those authored in other languages and those translated from other languages into English. The findings and limitations of this study suggest areas for future research on the acceptance of artificial intelligence in electronic commerce should focus on the relationship between identified factors to improve the acceptance of artificial intelligence in electronic commerce. Empirical data can support the developed model. As the timeframe in this study was confirmed to be limited, future studies should include articles from the first-time artificial intelligence was introduced in electronic commerce until now to determine whether and how to change the acceptance. These patterns will affect the acceptance of artificial intelligence in electronic commerce in the future.

Therefore, testing the acceptance of artificial intelligence in e-commerce models is essential to effectively tailor service strategies using AI as a supportive tool. Researchers and business entrepreneurs interested in this field should conduct targeted data collection within specific contexts, regions, or demographic groups they wish to examine. The results of such tests can inform improvements in customer service for those who are hesitant about AI in e-commerce. Additionally, for customer segments to embrace artificial intelligence and enhance their online shopping experience, strategies can be refined to cater to those who already accept AI in commerce, thereby fostering a superior customer journey overall.

References

Al-Emran, M., & Granić, A. (2021). Is It Still Valid or Outdated? A Bibliometric Analysis of the Technology Acceptance Model and Its Applications From 2010 to 2020. In M. Al-Emran, & K. Shaalan. (eds.). *Recent Advances in Technology Acceptance Models and Theories* (pp. 1-12). Cham: Springer.

Chhikara, D., Sharma, R., & Kaushik, K. (2022). Indian E-Commerce Consumer and their Acceptance towards Chatbots. *Academy of Marketing Studies Journal, 26*(S5), 1-10.

Davis, F. (1986). *A Technology Acceptance Model for Empirically Testing New End-User Information Systems: Theory and Results*. Massachusetts: Massachusetts Institute of Technology.

Davis, F. (1989). Perceived Usefulness, Perceived Ease of Use, and User Acceptance of Information Technology. *MIS Quarterly, 13*(3), 319-340.

Goli, M., Sahu, A., & Bag, S. (2023). Users' Acceptance of Artificial Intelligence-Based Chatbots: An Empirical Study. *International Journal of Technology and Human Interaction, 19*(1), 1-18.

HardcoreCEO. (2021). *The Future of E-Commerce with the Use of AI to Meet Customer Needs*. Retrieved from https://hardcoreceo.co/ecommerce-ai-future.

Nagy, S., & Hajdú, N. (2021). Consumer acceptance of the use of artificial intelligence in online shopping: Evidence from Hungary. *Artificial Intelligence in Wholesale and Retail, 23*(56), 155-173.

Piriyakul, M. (2015). Moderator and mediator in Structural Equation Modeling. *The Journal of Industrial Technology, 11*(3), 83-96.

Singh, C., Dash, M., Sahu, R., & Kumar, A. (2024). Investigating the acceptance intentions of online shopping assistants in E-commerce interactions: Mediating role of trust and effects of consumer demographics. *Heliyon, 10*(3), e25031.

Thamma, N., Anywat-Napong, W., Thongprayoon, W., Luepong, P., & Anywatnapong, M. (2023). The Influence of AI Marketing Technology on Online Purchasing Decisions of

Household Consumers in Thailand. *Journal of Digital Business and Social Science, 9*(1), JDB009.

Thamma, N., Anywatnapong, W., Tunpornchai, W., & Saetang, C. (2024). Transforming E-Commerce: Artificial Intelligence Effect on Purchase Decision and Happiness. *Asian Administration and Management Review*, *7*(1), 133-144.

Wang, C., Ahmad, S., Ayassrah, A., Awwad, E., Irshad, M., Ali, Y., Al-Razgan, M., Khan, Y., & Han, H. (2023). An empirical evaluation of technology acceptance model for Artificial Intelligence in E-commerce. *Heliyon, 9*, e18349.

Data Availability Statement: The raw data supporting the conclusions of this article will be made available by the authors, without undue reservation.

Conflicts of Interest: The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

Publisher's Note: All claims expressed in this article are solely those of the authors and do not necessarily represent those of their affiliated organizations, or those of the publisher, the editors and the reviewers. Any product that may be evaluated in this article, or claim that may be made by its manufacturer, is not guaranteed or endorsed by the publisher.