

Technology Acceptance Models of E-Commerce Adoption in Small and Medium-Sized Enterprises: A Systematic Review

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ABSTRAK

Adopsi e-commerce berlaku untuk semua sektor bisnis. Ecommerce dinilai mampu memperluas jangkauan pasar, meningkatkan efisiensi operasional, dan memacu pertumbuhan bisnis dengan potensi pasar digital. Namun, adopsi ecommerce dalam skala bisnis kecil atau dikenal SME rasanya masih perlu dikaji lebih lanjut. Disini kami melakukan studi literatur pada 28 artikel terpilih berdasarkan kriteria inklusi dan eksklusi untuk menemukan faktor apa saja yang paling berpengaruh terhadap adopsi ecommerce pada SME. Kami menemukan bahwa adopsi ecommerce dengan TAM fokus pada pengembangan model didasarkan pada variabel eksternal, terutama faktor-faktor dari teori atau model lain. Isu utama yang sering dibahas mengenai penerimaan e-commerce yaitu pada skala industri mikro dengan hasil penelitian paling banyak, metode survei sebagai metode penelitian yang paling banyak digunakan. Kemudian kami juga menemukan faktor utama yang paling banyak ditemukan berdasarkan distribusi peneliti. temuan ini diharapkan dapat digunakan pada penelitian selanjutnya yang mengkaji adopsi ecommerce dengan TAM pada SME.

Kata Kunci:

Technology Acceptance Model; Adopsi E-Commerce; Small Medium Enterprise (SME); Tinjauan Literatur

Keywords :

Technology Acceptance Model; E-Commerce Adoption; Small and Medium Enterprises (SMEs); Literature Review

ABSTRACT

The adoption of e-commerce applies to all business sectors. Ecommerce is considered capable of expanding market reach, improving operational efficiency, and spurring business growth with the potential of the digital market. However, the adoption of e-commerce on a small business scale, known as SME, still needs to be studied further. Here, we conducted a literature study on 28 articles selected based on inclusion and exclusion criteria to find out what factors have the most influence on e-commerce adoption in SMEs. We found that e-commerce adoption with TAM focuses on model development based on external variables, especially factors from other theories or models. The main issue that is often discussed regarding e-commerce acceptance is at the micro-industry scale, with the survey method being the most widely used research method. Then we also found the main factors that are most widely found based on the distribution of researchers. These findings are expected to be used in future studies that examine e-commerce adoption with TAM in SMEs.

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INTRODUCTION

The increasing trend of e-commerce usage among small and medium-sized enterprises (SMEs) has led to an increase in intensive research on e-commerce features and e-commerce acceptance among consumers and business owners. Based on empirical data, e-commerce adoption has a positive impact that is not limited to large companies. (Akdim 2021; Al-naimat et al. 2020; Alam et al. 2021; Francioni et al. 2022; Kawa and Światowiec-Szczepańska 2021), but also for Micro, Small, and Medium Enterprises (MSMEs). (CHIN et al. 2021; Činjurević, Pijalović, and Peštek 2021; Fauzi 2019; Nassir et al. 2023; Niranjala 2020; Sarfo and Song 2021; Shahzad et al. 2020). On the other hand, as the benefits of e-commerce increase, especially for small MSME businesses, there is increasing interest in exploring the purpose of e-commerce in the context of MSMEs (Haryanti and Subriadi 2020) and its acceptance factors (Akanbi and Akintunde 2018).

Information systems (IS) implementation requires significant financial and time investments, and IS professionals are constantly working to identify factors that influence system adoption. These various elements are often combined into a single model to analyze system acceptance more effectively. To achieve this goal, various IS models have been developed, including the Technology Acceptance Model (TAM) developed by (Davis 1989). According to (Fayad and Paper 2015) The Technology Acceptance Model (TAM) continues to be one of the most widely used models to assess the level of acceptance of information systems (IS) due to its adaptability, simplicity, and validity. In the context of e-commerce, TAM has undergone significant changes and improvements that contribute positively to e-commerce acceptance. Current research is under active development, focusing on different perspectives related to the development of the technology acceptance model (TAM), and several literature reviews have been conducted that attempt to provide a more in-depth understanding of TAM. (Albashrawi 2021; Činjurević et al. 2021; Haryanti and Subriadi 2020; Putri, Aini, and Solekah 2023). Although researchers believe that any literature review will provide valuable conclusions regarding the technology acceptance model (TAM), they still believe that further research from various perspectives is needed. In the context of implementing information technology, especially in the context of micro, small and medium enterprises (MSMEs), there is limited attention to TAM research. Therefore, researchers consider research from various points of view, including the year of publication, industry context (either small, medium, or large), research methods (questionnaires, interviews, mixed methods, etc.), and other factors. Important to consider. The TAM model we predict has two main components. It is about perceived benefits and ease of use.

This systematic literature review reveals that these topics are critical to understanding the trends of Technology Acceptance Model (TAM) research on micro, small and medium scale (MSME) e-commerce research. In addition, research shows that the determinants of e-commerce adoption among MSMEs remain unclear, which is one of the persistent and critical issues faced by researchers in the field of information systems (Chau and Deng 2021; Hardiyanto, Rafdinal, and ... 2022; Niranjala 2020; Reyes-Mercado and Barajas-Portas 2020; Shemi and Procter 2018; Soong, Ahmed, and Tan 2020). This study focuses on the factors that influence the adoption of e-commerce systems in the MSME sector and attempts to analyze the collected findings. Understanding the factors that influence the adoption of e-commerce in MSMEs in the collected studies will help researchers plan in advance to examine the influence of other factors that are not discussed in the current literature. Overall, it is predicted that this study will provide important insights for increasing e-commerce among MSMEs. This study, in particular, assesses and integrates research on e-commerce-related technology adoption models (TAMs) in micro, small, and medium-sized firms (MSMEs) to give a thorough overview of past research findings. This review specifically addresses the following three research questions:

RQ 1: What is the distribution of the analyzed studies by year of publication?

RQ 2: Small and medium-sized enterprises (What are the main situations and research methods commonly used when implementing e-commerce in MSMEs?)

RQ 3 : What are the most commonly used elements to complement the Technology Acceptance Model (TAM)?

RESEARCH METHODS

In order to conduct this study's systematic review, we reviewed a collection of research articles gathered from numerous database sources, including ScienceDirect, Google Scholar, Wiley, Scopus, Springer and Emerald. The methodology of this review study refers to (Al-Emran, Mezhyuev, and Kamaludin 2018). Here is a reorganization of the main steps in the guide:

A. Criteria for Inclusion and exclusion

The selection of articles was based on the fulfillment of the inclusion and exclusion criteria listed in Table 1.

Table 1. The study's inclusion and exclusion criteria for e-commerce in SMEs and TAM

Criteria for Inclusion	Criteria for Exclusion
TAM and E-commerce must be included in SMEs.	TAM that is not applied on online purchases.
SME participation is required.	TAM applied outside of the context of SMEs.
The essay must be written in English.	TAM that is used in a general learning context, but not with Ecommerce.
Between 2018 and 2023, the work must be published.	Papers with languages other than English.

B. Sources of data and techniques for searching

This literature review was conducted by searching for articles related to the topic under study from 2018 to 2023 in the following databases: ScienceDirect, Google Scholar, Wiley, Scopus, Springer and Emerald. The search queries contained the keywords "technology acceptance model" and "electronic commerce" as well as "TAM" and "electronic commerce." The search results showed 693 articles with these keywords in total. After that, 253 items in total were disregarded for being duplicates. As a result, 440 papers in all were gathered. The researchers verified each study's inclusion and exclusion criteria. The analysis process made use of a total of twenty-eight research articles that satisfied the inclusion criteria.

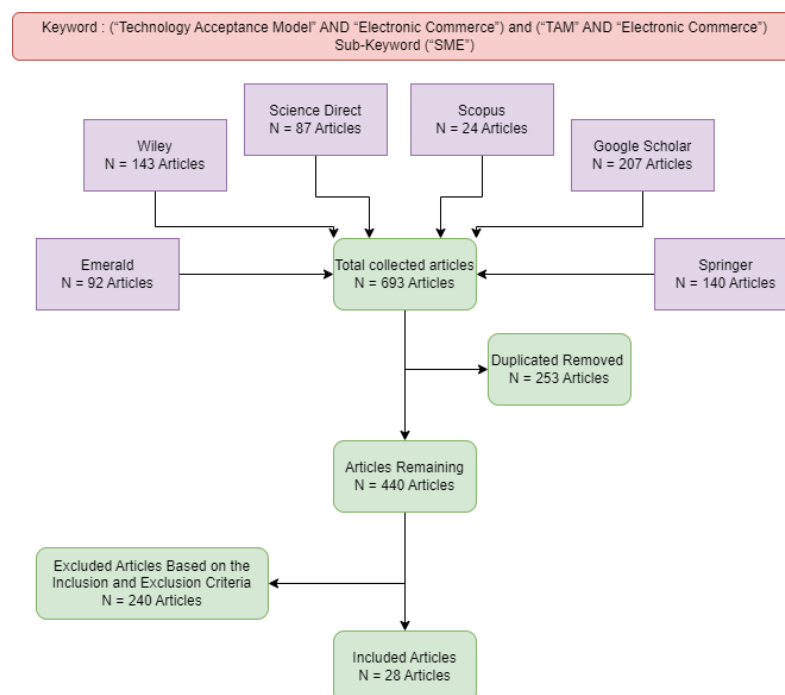


Figure 1. Literature review process

Figure 1 illustrates the literature review process and how each article was processed.

This research begins by determining the keywords used to search for existing literature. The keywords used are ("Technology Acceptance Model" AND "Electronic Commerce") and ("TAM" AND "Electronic Commerce") Sub-Keyword ("SME") 693 articles were found in the ScienceDirect, Google Scholar, Wiley, Scopus, Springer, and Emerald databases. Then we removed the duplicated articles—about 253—so that the main articles remained at 440. Then, to improve the quality of our articles based on determining the inclusion and exclusion criteria as described in point A, Finally, we found 28 main articles that became the main discussion in this study.

C. Data coding and analysis

A year of publication, context (i.e., small, medium, and large industry fields), and method (i.e., survey, interview, and mixed methods) were the three features that were coded in this study in relation to the quality of systematic reviews. The factors that were used to predict the two main constructs of TAM ("perceived usefulness" and "perceived ease of use") were the third feature. The most influential researcher is then one new discovery.

RESULTS AND DISCUSSION

The outcome of this review process is based on three research questions, and we synthesized the data based on the inclusion and exclusion criteria of 28 studies on TAM models for e-commerce in SMEs from 2018 to 2023:

A. Study distribution by year of publication

The following figure shows the distribution of published articles on the topic of e-commerce implementation in MSMEs using TAM. The line chart shows the number of papers published per year from 2018 to 2023.

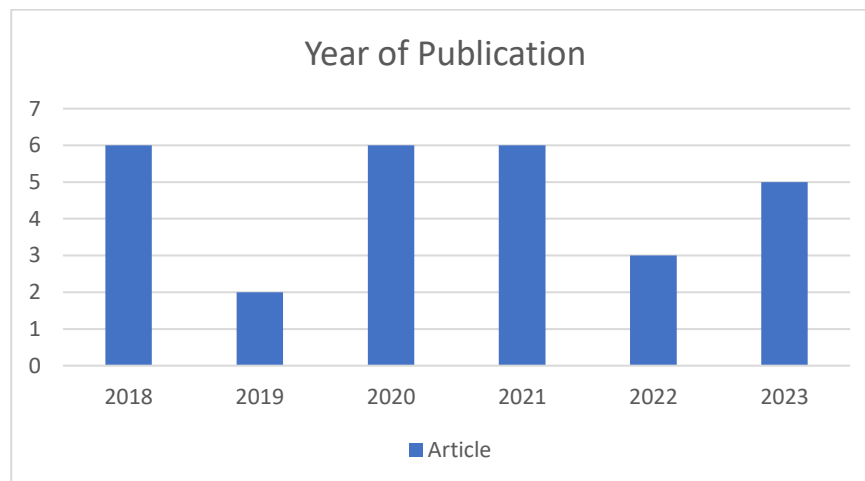


Figure 2. Year of publication

The graph depicts the distribution of E-commerce publications by publication year, which involves research from 2018 to 2023. It can be observed that the number of publications remained stable in 2018, 2020, and 2021, each with 6 research articles, although it decreased in 2019 with only one article. Additionally, there is a decrease in the publication ratio to 3 in 2022, which then increases to 5 in 2023. It should be noted that these findings only reflect the number of E-commerce in SME papers that employ TAM as the theoretical model, and do not include all E-commerce in SME studies.

B. Study deployment by context and methodology

The distribution of the examined studies according to the research context is depicted in Figure 3 below. It was noted that 53.57% (N=15) of the total studies analyzed focused on the micro

enterprise sector. Meanwhile, the percentage of small and medium enterprises is 32.14% (N=9), and the percentage of medium enterprises is 14.29% (N=4).

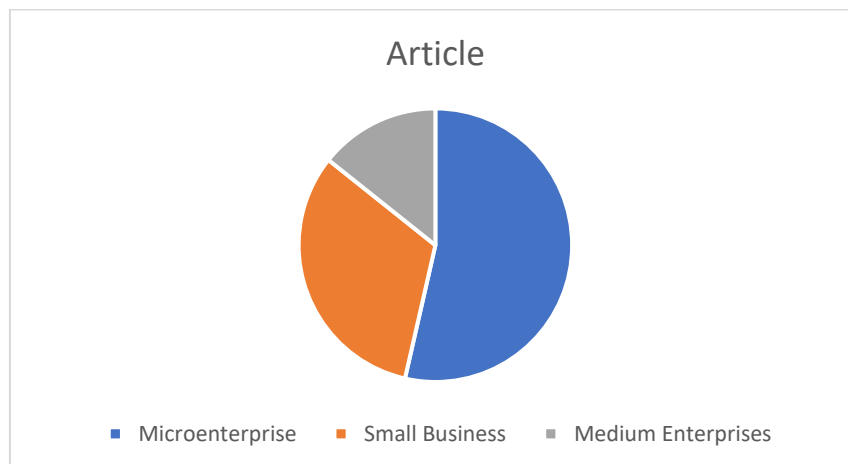


Figure 3. Context of the discussion

As shown in Figure 4, three different research methods were applied to investigate e-commerce adoption in SMEs using the TAM model. Of the 28 studies analyzed, 17 papers (80%) chose questionnaire surveys as the main method of data collection. This was followed by three studies that used both methods (questionnaires and interviews), and another eight studies that focused on interviews as the main method.

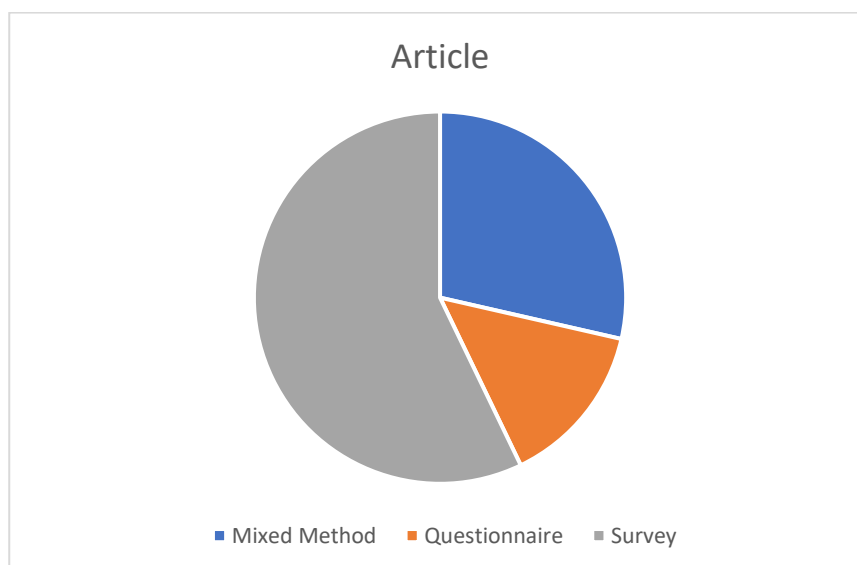


Figure 4. Distribution of methodology

Among the 28 studies analyzed, there are differences in the research methods used to discuss the implementation of e-commerce research in SMEs using the TAM model. A total of 16 studies (57.14%) chose questionnaires as the main method, 8 studies (28.57%) used mixed methods, and 4 studies (14.29%) chose questionnaires as the main approach.

C. Distribution of studies based on supporting factors

Many critical elements connected to e-commerce adoption in small and medium-sized firms (SMEs) have been discovered in various study articles. According to (Akanbi and Akintunde 2018), perceived ease of use (PEU) is a factor impacting e-commerce adoption among small and medium-sized businesses. Perceived usefulness (PU) emerged as a frequently discussed factor in many papers such as (Busnetty and Tambunan 2020), (Fauzi et al. 2021; Hassan and Shahzad 2022) highlighted the importance of perceived usefulness to entrepreneurs. Trust and perceived

behavioral control have also been highlighted in several studies such as Hamed, Madihah (2018) and Shahzad et al. (2020). In addition, social and cultural aspects also play a role, as suggested by (Govinnage and Sachitra 2019; Sebastian et al. 2021) as well as technology and information security factors discussed in Akanbi and Akintunde (2018) and Hassen, Rahim (2019) are also important concerns in understanding e-commerce adoption in SMEs. These parts, when combined, create a complete knowledge framework addressing the complexity and multidimensionality of difficulties and opportunities in SMEs' adoption of e-commerce. Please see the following diagram for more information:

Factor	Source of Article
Perceived Ease of Use (PEU)	(Akanbi and Akintunde 2018)
Perceived Usefulness (PU)	(Busnetty and Tambunan 2020; Fauzi et al. 2021; Govinnage and Sachitra 2019; Kumar and Kaur 2021; Misra, Mahajan, and Singh 2020; Niranjala 2020; Nurchayati et al. 2023; Otoo et al. 2018; Putri et al. 2023; Raharja et al. 2019; Ruiz et al. 2021; Shahzad et al. 2020; Shemi and Procter 2018; Twaambo and Phiri 2021)
Attitude Toward Use	(Fauzi et al. 2021)
Trust	(Hamed, Madihah, and ... 2018; Shahzad et al. 2020)
Perceived Behavioral Control	(Shahzad et al. 2020)
Availability of Support Services	(Nurchayati et al. 2023; Raharja et al. 2019)
Social and Cultural Factors	(Govinnage and Sachitra 2019; Ruiz et al. 2021; C A Sarfo and Song 2021)
Availability of Technology Infrastructure	(Akanbi and Akintunde 2018)
Technology Uncertainty	(Hassen, Rahim, and ... 2019)
Availability of Information Security	(Akanbi and Akintunde 2018)
Regulation and Compliance	(Nazir and Roomi 2020)
Availability of Financial Resources	(Nazir and Roomi 2020)
Entrepreneur Experience	(Akanbi and Akintunde 2018; Otoo et al. 2018; Shemi and Procter 2018)
Product/Business Innovation	(Sombultawee 2020)
Previous User Experience	(Nurchayati et al. 2023)
Seller Reputation	(Sombultawee 2020)
Availability of Delivery Network	(Shahzad et al. 2020)
Interaction with Other Users	(Ruiz et al. 2021)
Service Personalization	(Niranjala 2020)
Psychological Factors	(Akanbi and Akintunde 2018)
Integration with Internal Systems	(Christian Agyapong Sarfo and Song 2021)
Website Speed and Availability	(Ruiz et al. 2021)
Responsiveness to Mobile Devices	(Nurchayati et al. 2023)
Availability of After-Sales Service	(Shahzad et al. 2020)
Integration with Social Media	(Niranjala 2020)
Environmental Factors	(C A Sarfo and Song 2021)
Compliance with Privacy Regulations	(Nazir and Roomi 2020)
Business Ethics Factor	(Nazir and Roomi 2020)
Partnership with Third Parties	(Shahzad et al. 2020)

Figure 5. The most frequently occurring factors in e-commerce adoption studies in SMEs

Research Distribution by Researcher

The diagram below provides an overview of the factors identified in a number of research papers related to e-commerce adoption by small and medium-sized enterprises (SMEs). Based on the table, notable research papers in this area include the work of Shahzad et al. (2020) presenting seven identified factors that reflect the diversity and complexity of factors influencing SMEs' e-commerce adoption decisions. Akanbi and Akintunde's (2018) and Nazir and Roomi's (2020) articles address five factors each and provide deep insights into the key variables that small and medium-sized entrepreneurs need to consider. In addition, there are several studies such as: B.

Lewis et al. (2021), Sarfo and Song (2021), Nurchayati et al. (2023) identified three factors and emphasized focus on specific aspects such as availability of support services and responsiveness to mobile devices. There are also several other articles such as Fauzi et al. (2021), Govinnage and Sachitra (2019), and Raharja et al. (2019) made important contributions in understanding the factors that influence e-commerce adoption at the SME level, although fewer factors were discussed.

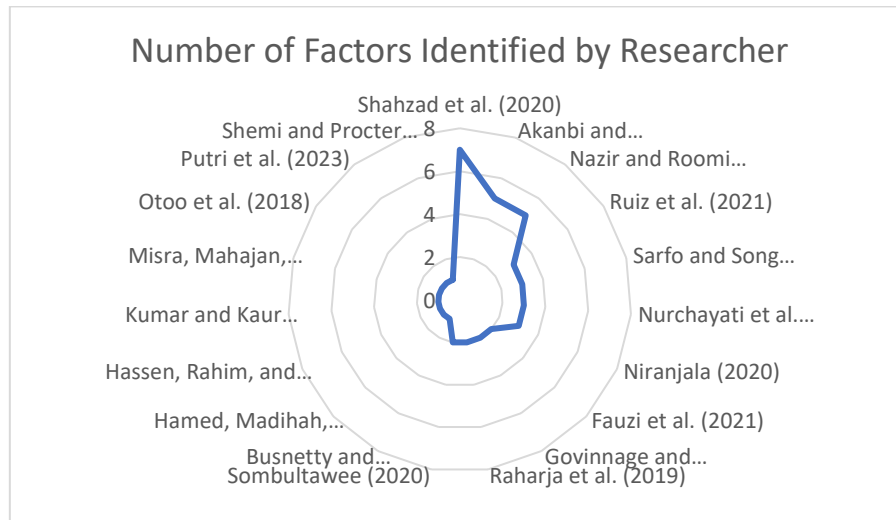


Figure 6. Distribution of articles by researcher

CONCLUSION AND FUTURE RESEARCH

Conclusion

A thorough literature review was conducted in this study. The main purpose of this review was to thoroughly analyze the existing literature and discuss the results in depth. The analysis of this review revealed four important new findings. First, the annual sales survey on e-commerce adoption in small and medium-sized enterprises (SMEs) shows that the research trend in this area is relatively stable. While there was a decline in 2019 and 2022, there was a significant increase in 2023, indicating that interest in this topic continues. This indicates that research on the use of e-commerce in small and medium-sized enterprises continues to attract attention, as the e-commerce field continues to grow and diversify. Secondly, the main research objective of most TAM studies on e-commerce adoption in SMEs is to extend TAM by including external variables, and then using elements from other theories and models to refine the model. The research continues to evolve. Thirdly, whatever the purpose of the research, mixed-method surveys and research methods are the primary choice in data collection. Finally, researchers tend to contribute more external factors to expand the TAM model, thus suggesting efforts to enrich the conceptual framework with additional variability.

Future Research

Only databases such as ScienceDirect, Google Scholar, Wiley, Scopus, Springer and Emerald were used to collect articles for this systematic review. Additional research could broaden the scope of this study by incorporating findings from additional databases, such as ACM Digital Library, EBSCO, and Web of Science, as well as other sources of scientific knowledge. Such research might be carried out to guarantee that the literature analysis is more inclusive and representative.

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