
ОБЗОРЫ И ДИСКУССИИ REVIEWS AND DISCUSSIONS

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THE DETERMINANTS OF E-COMMERCE IN SMALL AND MEDIUM-SIZED ENTERPRISES IN DEVELOPING COUNTRIES

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Abstract. E-commerce's explosive growth has altered the global business landscape and opened up numerous avenues for increased trade and economic expansion. Small and medium-sized enterprises (SMEs) in developing nations are still adopting e-commerce at a slow pace, despite the potential advantages. This study's objective is to examine prior studies to find themes and gaps in the existing research and present a cohesive synthesis that drive SMEs in developing nations to embrace e-commerce. This study employed a systematic literature review approach by conducting a thorough search applying PRISMA method to Scopus, Science Direct, Springer Link, Google Scholar, and Google Searches. The study examined 21 studies with peer reviews published between 2010 and 2024, which were selected out of 10000 studies. The study's findings identified five major factors that influence e-commerce adoption in developing countries: demographic, technological, organizational, environmental, and regional factors. This study outlines current perspectives and prominent topics for academic and practitioners to apply e-commerce adoption and barriers.

Keywords: SMEs, developing economies, e-commerce determinants, demographic, technological, organizational, environmental, regional, systematic review

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Обзорная статья

ДЕТЕРМИНАНТЫ ЭЛЕКТРОННОЙ КОММЕРЦИИ В МАЛЫХ И СРЕДНИХ ПРЕДПРИЯТИЯХ РАЗВИВАЮЩИХСЯ СТРАН

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Аннотация. Динамичное распространение электронной коммерции изменило глобальный бизнес-ландшафт и открыло множество возможностей для расширения торговли и экономик стран. Малые и средние предприятия (МСП) в развивающихся странах по-прежнему внедряют и адаптируют электронную коммерцию медленными темпами, несмотря на потенциальные преимущества. Целью настоящего исследования является систематизация существующих знаний для выявления ключевых тем, пробелов и формирования целостной системы факторов, влияющих на возможности ускорения цифровой трансформации МСП в развивающихся странах. Используя методологию систематического обзора литературы (PRISMA), авторы проанализировали массив публикаций в базах данных Scopus, Science Direct, Springer Link, Google Scholar

и др., отобрав для финального анализа 21 рецензируемое исследование (2010–2024 гг.) из первоначальных 10 000 публикаций. Результаты исследования выявили пять основных факторов, влияющих на внедрение электронной коммерции в развивающихся странах: демографические, технологические, организационные, экологические и региональные факторы. В этом исследовании обобщаются текущие перспективы и актуальные темы для исследователей и практиков, касающиеся практических ориентиров и барьеров внедрения электронной коммерции.

Ключевые слова: МСП, развивающиеся экономики, внедрение электронной коммерции, демографические факторы, технологические факторы, организационные факторы, экологические факторы, региональные факторы, систематический обзор

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Introduction

The internet has become one of the most widely used technologies in modern society and an important source of communication and information. With the growing popularity of the internet and websites, electronic commerce has become feasible. Utilization of modern information and communication technologies (ICT) is a key element in the growth of global markets and facilitation of businesses to engage in transactions that transcend national boundaries. In this regard, e-commerce has become a significant innovation in terms of ICT [42]. The shift of the traditional trading system to the online platform has greatly changed how the businesses are conducted and communicated with customers and hence e-commerce has become a critical part of the modern business system [18].

E-commerce enables buyers and sellers to communicate and transact business without a physical approach. Its rising popularity across the globe is linked to various benefits such as lowering of operation costs, enhancing of flexibility, ability to enhance transparency and accountability, reaching a wider market base, and acceleration of transaction activities. The ongoing development of internet technologies has provided new opportunities to businesses and consumers in accessing and using digital services in different ways. Generally, e-commerce can be defined as the application of information technology to transact business and commercial activities online [25].

Technological advancement has greatly contributed to the growth of e-commerce and economic and social development. ICT innovations affect financial, social, human, and economic development, especially in developing nations [2]. Digital technologies have also led to job creation, expansion of SMEs, and enhanced standards of living in most developing economies [12; 5].

In recent years, the pace of e-commerce growth has increased, especially after the COVID-19 pandemic, which made online shopping more convenient and secure. Generally, the process of purchasing and selling goods and services via the internet or any other digital network is called e-commerce. Using digital platforms, businesses can communicate better with customers, suppliers, business partners, financial institutions, and government organizations [3]. Consequently, e-commerce has continued to transform the world of business.

SMEs are a very crucial sector of the national economies since they create jobs and boost the economy. SMEs are often defined as having limited financial resources, small organizations, and relatively few employees. According to World Bank SMEs are defined as businesses that have fewer than 250 employees [43]. SMEs are highly competitive in both local and global markets. In order to stay competitive and guarantee long-term sustainability, the number of digital technologies implemented by many SMEs grows including e-commerce [3; 37]. Adoption of e-commerce can offer several benefits to SMEs such as efficiency in operations, reduction of costs, better customer relations and market accessibility [3]. Moreover, online platforms allow SMEs to increase their geographical coverage, access new markets, and find more customers. However, even with such possible advantages, the majority of SMEs in developing nations continue to fail in successfully adopting and integrating e-commerce technologies [26].

Previous studies have found various factors that determine the adoption of e-commerce among SMEs especially in the developing nations. Research in Pakistan, identified perceived benefits, firm size, top management support, and perceived ease of use as crucial determinants [29]. However, I. Sila found that there are some significant challenges such as internet availability, trust, security, and online payment

system that SMEs in underdeveloped countries face when implementing technologies [36].

A number of studies identified key factors influencing the adoption of e-commerce among Indian SMEs. Knowledge, human resources, organizational strategy, and competitiveness have been reported to be the major factors that have contributed to the adoption of e-commerce technologies [44; 11]. The significance of security issues, competitive advantage, service providers, external pressure, and management support are also highlighted to affect technological adoption [20]). Likewise, top management support, openness to change, IT preparedness, cost, and relative advantage are all important influencing factors in the use of e-commerce by SMEs [37].

Perceived barriers were recognized as the major issue in Malaysia, whereas compatibility, relative advantage, managerial capability, and external factors were found to affect the process of adoption [23]. The importance of organizational readiness and competitive pressure [1], technological preparedness, owner innovativeness, and IT competency [33; 40] are also emphasized in studies that are conducted in the frames of the Technology Organization Environment (TOE) framework. Other reports underline the significance of organizational preparedness, IT infrastructure, qualified staff, and outside aid including the government regulation and rivalry [13; 4].

Besides this, there is the use of technological infrastructure and institutional support, which are interested in the e-commerce adoption. Research studies in Tanzania and Sri Lanka have shown that the adoption e-commerce by SMEs depends greatly on technological infrastructure, the level of computer literacy, and government support [24; 10]. More recent works also point to the role of technological, organizational, environmental, and individual factors in the use of e-commerce by SMEs in various developing countries [35; 30].

Although the research on the adoption of e-commerce is growing, the implementation of digital commerce technologies is relatively low among SMEs in most developing nations [33]. It means that there is a severe gap in research on the issue of the factors that determine e-commerce adoption in these regions. Thus, the purpose of the study is to investigate the factors influencing the adoption of e-commerce to SMEs in developing nations by conducting a systematic literature review. Through the synthesis of available research findings, the study aims at formulating a conceptual framework that will describe the technological, organizational, and environmental factors that affect the adoption of e-commerce by SMEs.

Research Methodology

This study utilized systematic literature review (SLR) methodology, which is a basic feature of any study, as a key element in the structuring of an area of research [8]. As D. Tranfield demonstrated, a systematic review has a more transparent process of selecting papers as compared to a traditional narrative literature review [39]. This reduces bias of the researcher and improves the accuracy of the review. A systematic literature review has been conducted to locate quality papers related to adoption of e-commerce in developing countries. This method is important in identifying the body of knowledge (BoK) in a discipline which is a crucial step in research development [22]. In order to gain an in-depth insight into the field of information systems (IS) and information management (IM) studies, it helps to explore numerous viewpoints, the history of the topic, possible issues, and the direction of future study [38; 34]. The proposed study is mostly explanatory, which can follow a specific type of literature review, like meta-analysis [7; 31]. This research contributes to the study of the concept by offering a model that determines factors that affect the adoption of e-commerce among SMEs in developing countries, which is a novel contribution.

Data sources and search strategy

We have searched several electronic databases, specifically Springer Link, Science Direct, Scopus and Google Scholar. We also used Google Search to get the statistical data and grey literature on the adoption of e-commerce in developing countries. The search was done between March and November 2024. The study covered research published between 2010 and 2024. The timeframe 2010–2024 was chosen to reference the most recent works on this topic. “E-commerce,” “adoption,” “small and medium enterprises,” “developing countries,” and “factors influencing e-commerce” were among the key terms used. We also used synonyms and associated terms such as “e-business,” “emerging economies,” “determinants,” and “influences” to further refine the search results. Backward search was also used to extract certain papers from the reference lists of the papers that were considered important and inclusive of the study [41; 22].

Criteria for inclusion and exclusion

Defining the inclusion and exclusion criteria of the studies to be analyzed is a key factor in a systematic literature review. These criteria assist in explaining the inclusion and exclusion criteria of publications in the review [27].

In this research, peer-reviewed journal articles and conference papers that were written in English and

published within 2010–2024 were considered. The review specifically concentrated on articles that analyzed e-commerce use among SMEs in developing nations. Restricting the analysis to the developing nations assisted in maintaining the relevancy of results to the context of the research. Articles published before 2010, non-peer-reviewed articles, opinion pieces, editorials, and news articles were excluded. Articles that were not focused on SMEs or on the developed nations alone were filtered out. We excluded repetitive publications or articles that did not provide new ideas or visions on the subject.

Data Extraction Procedure

The data extraction for this study began in March 2024 and completed it in November 2024. The major scholarly databases such as Science Direct, Springer Link, Scopus, Google Scholar, and Google Search were searched with several key word combinations. Keywords included e-commerce adoption, SMEs, and developing countries and other keywords to narrow the search included factors, determinants, influences and emerging economies. Peer-reviewed journal articles and conference papers written in English and published between 2010 and 2024 were only searched.

Peer-reviewed academic publications were mostly located in Science Direct, Springer Link, and Scopus, and Google Scholar was used to locate other relevant studies. Statistical reports and grey literature covering e-commerce use in developing countries were also identified using Google Search. Firstly, around 10,000 records were found in all databases, but some of them were duplicates. Other publications of similar research have cited huge initial samples, which have been narrowed down to a smaller group of pertinent articles [27; 15]. The PRISMA approach guided the implementation of strong filtering criteria to eliminate irrelevant publications [17]. Following these filters, 81 studies were left. The elimination of 10 duplicate records resulted in 71 remaining articles to review their abstracts. This step eliminated 30 articles, and further full-text screening narrowed the list to 21 potentially applicable studies on the determinants of e-commerce adoption among SMEs in developing countries. Figure 1 summarizes the selection process.

Analysis of the Data

This study employs qualitative research to examine 21 articles on the adoption of e-commerce in developing nations among SMEs. A thematic analysis is adopted to define the important elements of adoption

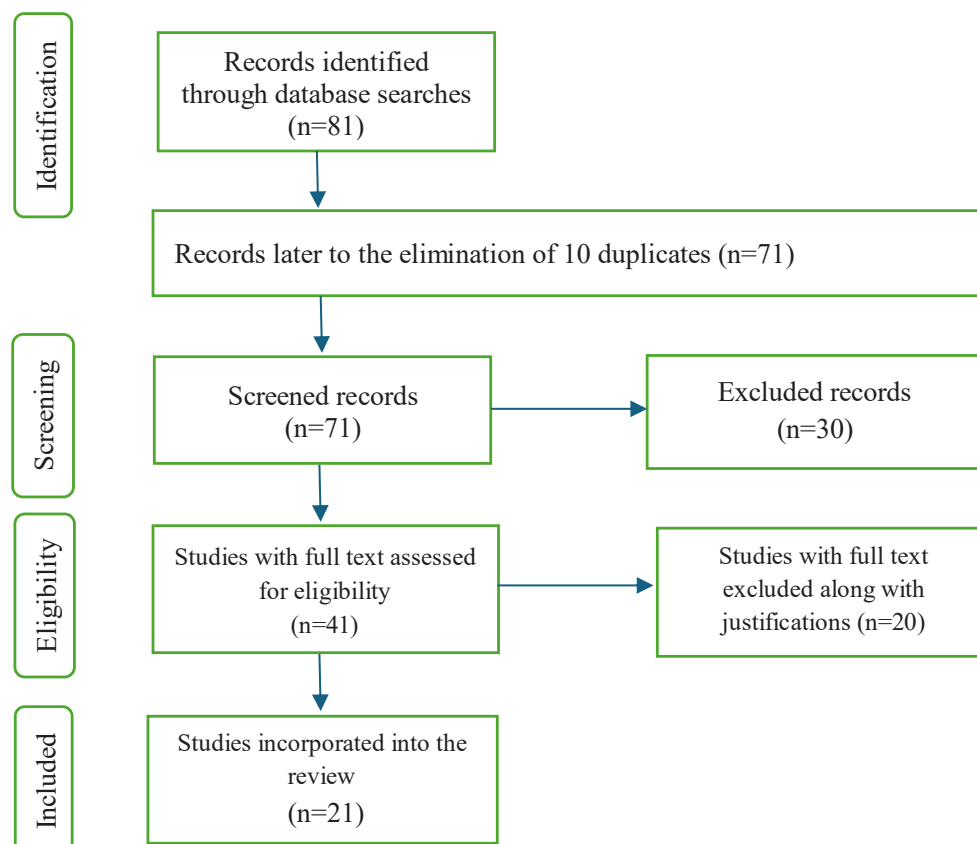


Fig 1. Prisma Chart
Рис. 1. Диаграмма PRISMA
Source: (Compiled by author)

using the six-step method suggested by V. Braun and V. Clarke [6].

Familiarization of Data: All 21 selected papers were read and relevant ideas were noted to be used in the next phase.

Data Coding: In order to guarantee that covered all data, the study coded sentences and paragraphs to find out key phrases and concepts of e-commerce adoption. The rest of papers were coded after reading and coding the initial few.

Coding into Themes: The original codes were grouped in themes. Themes that were mentioned by three or more sources were given priority; less frequent themes were relegated to a miscellaneous category to minimize bias.

Evaluation of Themes: The themes were considered to be pertinent to the research question. Themes were merged or segregated to ensure clarity and consistency.

Interconnection Analysis: The relations between the themes were analyzed and explicit. The key themes were technological, organizational, environmental, and regional factors.

Synthesizing Findings: We synthesized issues to form an overall summary of what we found. This synthesis involved the assessment of facts to create a rational argument to resolve our study question.

Findings

This paper has critically analyzed and reviewed 21 articles on adoption of e-commerce by SMEs in the developing countries. The results indicate that adoption is not determined by only one factor. In the studies that were reviewed, nine studies employed various theoretical approaches, and twelve studies employed Technology Organization Environment (TOE) framework. Other frameworks used in studies recognized five broad categories of factors including organizational, environmental, technological, demographic, and regional.

Demographic factors refer to the attributes of a population that could influence behavior, and decision making. The review indicates that these variables have a significant impact on e-commerce adoption. The experience, skills, and knowledge of owner-managers are vital in the process because these factors considerably influence decision-making in emerging economies [1; 29].

The results also suggest that ICT use can be gender-specific, with males and females tending to adopt and use technology differently. Another significant aspect of attitudes towards the use of technology is age [20; 29]. Moreover, prior experience in technology and IT skills enhance the chances of embracing

e-commerce [3]. Conversely, a low entrepreneurial attitude and innovation awareness can inhibit adoption. Lastly, the lack of literacy may also negatively affect the development of e-commerce since a significant portion of the population is unable to use online services due to their skill levels [10; 29].

Technological factors are defined as the infrastructure and technological resources needed to adopt e-commerce in developing economies [19; 14]. Perceived relative advantage is one of them; that is, SMEs will more readily use e-commerce in cases when they feel that it offers distinct advantages over the old business practices, including enhanced efficiency and competitiveness [1; 11; 13; 9]. There is also technological preparedness. Businesses that have adequate infrastructure and qualified staff can implement digital technologies more efficiently [35]. Moreover, innovative entrepreneurs are also more inclined to promote the use of e-commerce in their organizations [11; 37]. Effective IT infrastructure assists businesses to create and sustain online business [24]. Technology vendors can also aid adoption by offering training and technical support [20]. Furthermore, regulatory pressures and favorable policy environments impact the willingness of firms to embrace e-commerce (O. M. Nicholas et al., 2024). Lastly, competition also leads to the implementation of new solution to the changing customer demands like e-commerce [13].

Organizational factors are significant in the ability of SMEs to adopt and expand e-commerce. One of the key obstacles is financial cost because restricted access to external funds may limit the development of the business [4; 30]. Risk and uncertainty also make adoption discouraged due to the fact that small firms may have insufficient resources to cope with the new technologies [14; 35]. Moreover, high cost of internet, human resources, maintenance, training and consultancy may also restrict adoption [4]. Top management support is crucial since knowledgeable leaders about e-business can drive strategy and promote the use of digital technologies [37; 14]. The size of firms is also important since larger SMEs tend to possess additional funds to allocate to new technologies [30]. Internet accessibility to global markets can also encourage SMEs to embrace e-commerce [9]. The presence of organizational preparedness, such as appropriate infrastructure and highly qualified personnel, also enhances the chance of successful implementation [13; 23].

Environmental factors refer to the internal and external political, economic, legal, and market aspects of a developing country. The most prominent factors

that have been mentioned as influencing e-commerce adoption are external pressure, government support, enabling and facilitating conditions, and security and trust issues [23; 21; 10]. The decisions of firms to implement new technologies can be influenced by external factors, including customers, suppliers, partners, and government institutions [20; 23]. Firms are also forced to embrace e-commerce due to competition [11; 4]. Online transactions can be reinforced by government support, which implies proper regulations and programs [10; 4]. Nevertheless, there are still significant security issues and distrust of online platforms and payment systems [28; 4].

Regional factors are the local circumstances that determine the adoption and use of e-commerce by the SMEs. Attitudes towards technologies and online shopping vary significantly by the region since more technologies are adopted in cultures open to them [1; 11]. There should also be good technological infrastructure like good internet connection and secure payment system and areas with no such facilities present serious obstacles [24; 35]. Economic health is also associated with positively impacting the willingness and ability of SMEs to invest in e-commerce [32; 9]. Favorable market accessibility, which is promoted by effective logistics and transportation, is also an additional stimulus to adoption [20]. Lastly, the low level of ICT knowledge poses problems, and organizations need to create skilled personnel to use the opportunities of the e-commerce fully [44].

Discussion

This systematic review explains the variables affecting e-commerce adoption by SMEs in developing nations. The results of the conducted reviews identify five key categories of determinants: organizational, technological, demographic, environmental, and regional. Each of them plays a critical role toward shaping the e-commerce environment of SMEs in developing countries.

Demographic variables that were identified to affect adoption were; IT skills, age and gender of owner-managers. Past research indicates that digital literacy and prior technological experience have a positive influence on the utilization of e-commerce [33; 9]. Technology adoption can be also affected by gender distinctions, which underscores the need to increase access to ICT and training, particularly in developing nations in which cultural values can restrict the involvement of women in technology-related activities [1]. Age is also a significant criterion, with the younger entrepreneurs usually being more receptive to digital innovations [20].

Adoption also depends on technological factors such as perceived relative advantage, technological readiness and IT infrastructure. The implementation of e-commerce is more probable among SMEs when these benefits are acknowledged by them, including cost reduction, higher productivity, and better customer access [1; 9]. Sufficient infrastructure and qualified workers contribute to successful implementation, as well [33]. Moreover, technology providers can ease adoption with the help of training and technical support [20; 14].

The major organizational factors recognized in this analysis are financial cost, size of the company, management support, and organizational preparedness. The cost of internet access and the implementation of technology is still a significant problem of SMEs in the developing nations [4; 30]. One of the major obstacles to the adoption of e-commerce is financial limitations [14]. Top management support is also critical because the leadership commitment will drive the uptake of digital technologies [37]. The capability of larger firms to embrace e-commerce is generally higher due to their higher access to both financial and technical resources [4].

Adoption is also influenced by the environmental factors like external pressure, government support, and security and trust issues. SMEs usually tend to use e-commerce because of competitive pressure exerted by customers, suppliers, and other players in the market [11]. Government policies and supporting programs may also promote adoption by enhancing regulatory policies and infrastructure [10; 32]. Nonetheless, the issue of security and trust in online systems remains a limitation to broader usage [28].

Adoption is also affected by regional aspects such as cultural attitudes, technology infrastructure and economic conditions. SMEs willingness to adopt e-commerce can be enhanced by positive attitudes towards technology [1; 16]. Meanwhile, a stable internet connection and payment systems are necessary to ensure successful implementation, and those areas that do not have these components have major issues [24].

Conclusion

This paper has explored the factors that affect adoption of e-commerce by SMEs in developing nations with a systematic review of the available literature showing that e-commerce adoption is influenced by demographic, technological, organizational, environmental and regional factors. The demographic factors, including IT skills, age, and gender of the owner-managers, determine their willingness to embrace digital technologies. Technology preparedness

such as effective IT infrastructure and perceived benefits of e-commerce are also significant forces in promoting adoption. Management support, financial capacity, firm size, and general preparedness are organizational factors that greatly influence the capability of SMEs to adopt e-commerce solutions. Meanwhile, external conditions, such as competition, governmental policies, trust and security are environmental factors, which facilitate or deter the adoption. Regional factors including cultural attitudes towards technologies, economic factors and access to digital infrastructure that also affect the level of adoption in various developing economies.

The findings provide several practical implications. Governments can facilitate the use of e-commerce by enhancing digital infrastructure, providing incentives, and developing stable regulatory frameworks that foster confidence in online transactions. Technology providers and industry stakeholders can assist SMEs by training, technical assistance, and awareness initiatives that can increase ICT skills and mitigate resistance to new technologies. Meanwhile, to

be competitive, SMEs should consider enhancing employee capabilities, enhancing the organizational readiness, and embrace digital tools. Better logistics, faster internet, and electronic payment systems particularly in areas with poor infrastructure would further facilitate the growth of e-commerce.

This research has a number of limitations. It uses only secondary data and English-language sources, and this might omit such studies in other languages. The emphasis on SMEs in developing countries restricts the generalizability of results to other economic settings. Despite the use of several databases, some studies might have been missed due to differences in terminology and indexing. The SLR methodology also relies on a set of predetermined criteria that might limit the scope of research that is included. Empirical studies in particular areas and sectors, the use of multilingual sources, and the comparison of developing and developed nations should be a part of the future research. A new set of tools, including AI and blockchain, should also be analyzed, and how the patterns of adoption of these tools by SME change over time.

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