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Cracking the Code: A Systematic Literature Review of Factors Influencing Micro Business Technological Innovation Adoption

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Abstract: Microbusinesses are essential in promoting local economies by creating job opportunities, generating income, and improving community welfare. Yet, their adoption of technological innovation remains limited due to various internal and external barriers, making the research on this topic continue to expand and remain relevant. This study systematically reviews existing literature to identify the key determinants influencing technological innovation adoption in microbusinesses. The findings reveal that internal factors, such as digital literacy, education levels, psychological traits, and access to technology, play a significant role in shaping their adoption decisions. Notably, knowledge and education emerge as critical enablers, as informed microbusiness owners demonstrate a higher propensity for technological innovation adoption. External influences, including perceived usefulness and ease of use of technological innovation and social influence, further impact the adoption process. Based on these findings, targeted training programs with mentorship initiatives and policy interventions like financial incentives are recommended to facilitate this population's adoption of technological innovation. As for academics looking to review this topic systematically, future studies are suggested to incorporate a broader range of databases and must not stop replicating to continuously update the literature to include the most recent studies.

Keywords: *Microbusinesses, determinants, technological, innovation, adoption*

1. Introduction

Micro businesses, typically characterized as small enterprises with fewer than ten individuals, are instrumental in propelling economic growth and promoting innovative practices (Organization for Economic Co-operation and Development (OECD), 2017). Serving as catalysts for regional economic activity, they make substantial contributions to job creation, income generation, and the overall well-being of local communities (Azmi, 2020). To ensure their sustainability and prosperity in today's dynamic business landscape, the adoption of technological innovation is crucial (Eliakis et al., 2020; Martínez-Peláez et al., 2023). Technological innovation encompasses the economic process of introducing new technologies into production and consumption, including identifying new technological opportunities, mobilizing human and financial resources for their transformation into useful products and processes, and supporting these essential endeavors (Scherer, 2001). By adopting and implementing technological innovation, especially for micro businesses, these organizations can augment their competitiveness, improve productivity, and adeptly address evolving market demands (Karr et al., 2020; Surya et al., 2021).

Despite its potential, records have shown that the adoption of technological innovation among micro businesses remains low (Anton et al., 2023; Dorrington et al., 2016). In Southeast Asia, for instance, only a modest 20% of MSMEs have adopted even the simplest form of technological advancement one can adopt, which is Online-to-Offline platforms (Bain & Company, 2021). Even during pressing times, such as when the world fell to the ground due to COVID-19, the uncertainty and volatility of the market during the pandemic have made businesses hesitant to invest in new technologies, fearing that these investments may not yield immediate returns (Reuschl et al., 2022). Not accounting for the complexity and high costs associated with implementing advanced technologies, many businesses were deterred from adopting them (Osei et al., 2022) despite the technology having numerous benefits, including the ability to sustain the business. Therefore, given the pivotal role of technological innovation adoption within micro businesses, evaluating the various factors affecting such adoption is vital. Lamentably, the existing literature on technological innovation in the micro business domain has predominantly focused on the operators' implementation of the innovation (e.g.,

Borowski, 2021; Pougnet et al., 2022), barriers (e.g., Claudino et al., 2017; Jocevski et al., 2020; Lee et al., 2019), success factors (e.g., Grabowska, 2015; Moghavvemi et al., 2021; Phuangrod et al., 2017), and the diffusion within the industry (e.g., Jimenez-Mavillard & Suarez, 2020; Stylos et al., 2021) with limited discussion on how technological innovation is initially embraced or factors influenced its adoption (Juniarti & Omar, 2021). This paper undertakes a systematic literature review (SLR) that consolidates and assesses the current corpus of research on the determinants influencing technological innovation adoption in micro-enterprises.

This review aims to give a comprehensive understanding of the numerous factors at play in influencing the adoption by compiling and analyzing prior research findings. With these insights, specific policies, strategies, and interventions may be developed to encourage and support the adoption of innovation by microbusinesses, eventually promoting economic growth and sustainable development. In contrast to conventional literature reviews that may lack thoroughness and systematic methodology, the systematic approach utilized in this study facilitates the identification of all pertinent papers and documents that satisfy predetermined inclusion criteria, thereby enabling the examination of specific research inquiries with greater precision and rigor (Mengist et al., 2020; Snyder, 2019).

2. Literature Review

A micro-business represents the smallest category of business operations, with definitions varying across national boundaries based on each country's economic context and regulatory framework. In the United States, these enterprises are defined as microbusinesses with nine or fewer employees generating less than $250,000 in annual revenue (Fallon-O'Leary, 2024). The European Union takes a more generous view, establishing a threshold of €2 million in annual turnover (European Union, 2025), while India uses investment thresholds of ₹1 crore and an annual turnover of not more than ₹5 crore (Ministry of Micro, Small & Medium Enterprises, 2020). In developing nations such as Bangladesh, the definition incorporates even smaller operations with minimal capital investment, sometimes as low as $500 (Mukta et al., 2024). Australia takes a workforce-focused approach, with the Australian Bureau of Statistics (2012) classifying microbusinesses as those that employ between 0 and 4 individuals and often encompass sole proprietorships where the owner operates independently without extra staff. Meanwhile, Malaysia sets its sights on enterprises that generate under RM300,000 in annual sales or operate with fewer than five employees (SME Corp. Malaysia, 2020). Despite these varying definitions, microbusinesses consistently drive the local economies through entrepreneurship, and the advent of technological innovation has opened new horizons for their growth and sustainability. This advancement has emerged as a powerful enabler for these micro-businesses, offering transformative opportunities to overcome their inherent limitations of size and resources.

In the modern world, the terms "technology" and "innovation" are intricately intertwined as they continuously fuel and complement each other (Pang et al., 2020). When discussions revolve around technological advancements, innovation inevitably takes center stage. This strong association between technology and innovation can be attributed to several compelling reasons. Firstly, technology serves as a vital enabler of innovation (Zhang et al., 2022). Emerging technologies provide the essential tools and resources that empower individuals, organizations, and societies to conceive and develop new ideas, products, or processes (Zhang et al., 2019). These technologies act as catalysts, expanding the horizons of innovation by presenting novel possibilities and opportunities previously unimaginable (Shin et al., 2018). At the same time, technological progress often begets the necessity for innovation; as technology evolves and advances, it brings forth new challenges and complexities, which, in turn, demand innovative solutions (Jonek-Kowalska, 2021). This synergy between technology and innovation underscores their pivotal role in driving progress and shaping the contemporary landscape of technological innovation.

As this dynamic interplay continues to evolve, businesses have emerged as critical actors in translating technological potential into practical, value-creating solutions (Jiang & Li, 2020; Kung, 2021). One crucial mechanism through which this technological potential is translated into strategic opportunities is adoption. In this context, technological innovation adoption becomes more than a mere technological process—it represents a strategic imperative that enables organizations to navigate and leverage the complex interconnections between emerging technologies and innovative potential (Kruger & Steyn, 2022). The significance of technological innovation adoption becomes particularly pronounced when examining micro businesses.

The strategic importance of technological innovation adoption extends beyond immediate operational benefits. It represents a critical mechanism for micro businesses to remain relevant in an increasingly digital and interconnected global economy. By embracing technological innovations, these enterprises can develop dynamic capabilities that enable them to respond more effectively to market changes (Sullivan & Wamba, 2024), align better with customer demand, and enhance their competitiveness in a rapidly changing environment (Räisänen & Tuovinen, 2020).

3. Methodology

The review was guided by the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) protocol. The fact that PRISMA is a more generic standard widely utilized across numerous research domains makes it eligible for use in this study. The PRISMA approach, which consists of four distinct phases, namely identification, screening, eligibility, and inclusion, was developed to facilitate the identification and selection of scientific publications of superior quality (Santos et al., 2021).

Identification: According to Younger (2010), when conducting an SLR, it is recommended to employ a comprehensive search strategy involving multiple databases. This approach aims to increase the likelihood of identifying relevant publications. Similarly, Vassar et al. (2017) suggested that a comprehensive investigation should encompass a substantial range of databases, surpassing the mere examination of one or two, to mitigate the potential influence of selection bias. Hence, this particular section compiled existing research by conducting a comprehensive search across the electronic databases subscribed by the university library system, namely Scopus, Web of Science, and ScienceDirect, which are widely recognized for their academic credibility. The databases in question are renowned for their robustness and comprehensive coverage of a diverse array of academic journals. The previously posed inquiries have led to the formulation of specific terms: micro business, innovation, and technology acceptance/adoption. These keywords have been employed in conjunction with relevant and equivalent phrases. Subsequently, the aforementioned keyword combinations were subjected to diverse search methodologies, encompassing the utilization of field code functions, phrase searching, and Boolean operators. The search query employed is displayed in Table 1. This preliminary phase of the SLR has effectively obtained a total of 63 articles, comprising nine from the ScienceDirect database, 47 from Scopus, and seven from Web of Science.

Table 1: **The Search String**

Database	Search String
ScienceDirect/ Scopus	TITLE-ABS-KEY (("innovation adoption" OR "innovation acceptance" OR "technology acceptance" OR "technology adoption") AND ("microenterprise" OR "micro business" OR "micro firm" OR "micro-entrepreneur"))
Web of Science	ALL=(("innovation adoption" OR "innovation acceptance" OR "technology acceptance" OR "technology adoption") AND ("microenterprise" OR "micro business" OR "micro firm" OR "micro-entrepreneur"))

Screening: The selected articles underwent a rigorous and thorough evaluation process. During the initial screening process, redundant items were excluded, resulting in the elimination of a total of seven articles in the preliminary round. Next, the chosen articles must satisfy all inclusion criteria outlined in this SLR. First, note that the articles selected were between 2018 and 2022. This period was specifically chosen as it encompasses the pre-pandemic, pandemic, and initial post-pandemic periods, providing a distinctive perspective on the factors that influenced them before, during, and after unprecedented circumstances. Table 2 presents the other criteria employed in selecting the papers for inclusion in the review.

Table 2: Selection Criteria

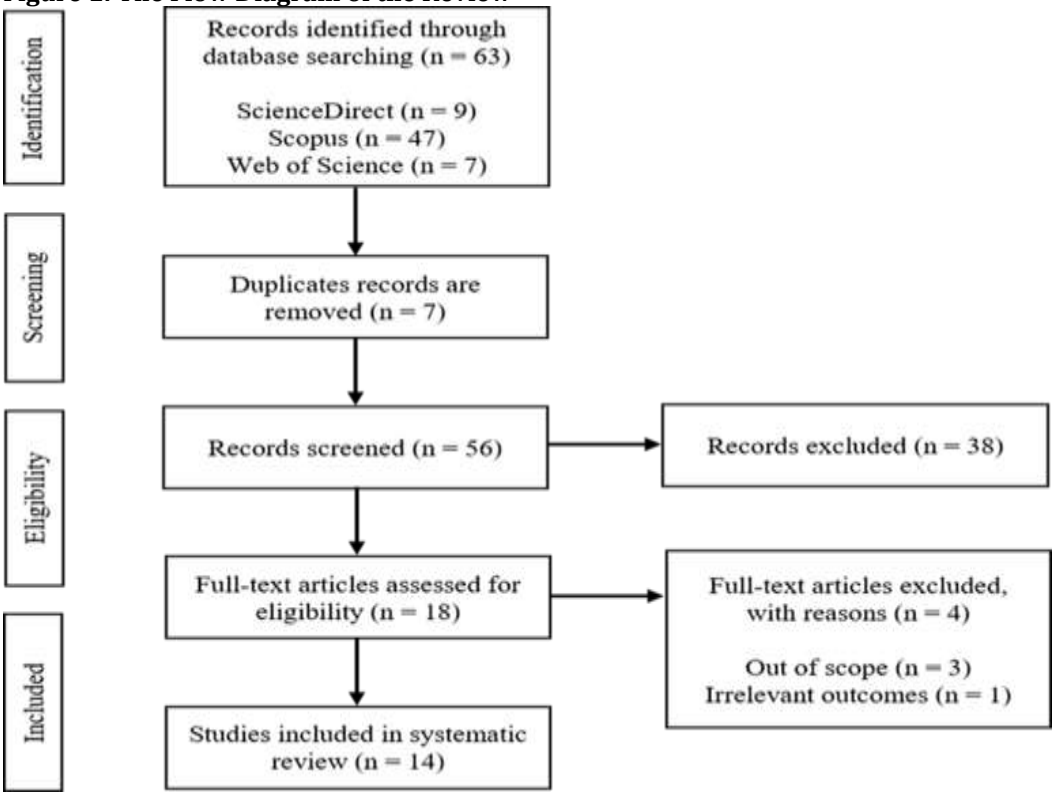
Criterion	Inclusion	Exclusion
Language	English	All other languages
Type of Publication	Peer-reviewed journal articles	Books; book chapters; conference papers and proceedings, theses; working papers; reports; press articles

Disciplines	All subject areas	None
Type of Research	Empirical	Theoretical; Reviews
Methodology	All	None
Sample	Micro Business/ Enterprise	Other Categories/ SME

Eligibility: The author manually examined the remaining articles, reviewing the titles, abstracts, and full papers to ascertain their adherence to the pre-established inclusion criteria. A total of 38 items were excluded based on the screening of titles and abstracts, followed by the exclusion of an additional four articles after a thorough examination of their content. Currently, a total of 42 publications have been excluded from consideration due to their classification as either pre-2018 review papers or their lack of relevance to the determinants influencing the adoption of innovation by microbusinesses. Ultimately, a total of 14 articles completed the initial evaluation phase, as depicted in Figure 1.

Inclusion: The evaluation of the remaining articles was conducted in a manner that ensured independence. Emphasis was placed on specific research that yielded responses to the designated inquiries. The extraction of data involved an initial review of the abstracts, followed by a comprehensive examination of the entire article to identify pertinent themes. A qualitative study was conducted to explore themes about the factors influencing the adoption of technological innovation in micro-businesses, utilizing thematic analysis as the research method. The selected articles were analyzed using a six-step thematic analysis procedure (Braun & Clarke, 2006; Clarke & Braun, 2017). This approach enables the systematic identification and interpretation of patterns or themes in the data, thereby facilitating a thorough comprehension of the articles. The analysis process commenced with a thorough perusal and familiarization of the articles to achieve a comprehensive understanding of the data. Initial codes were generated to encapsulate the main concepts and ideas that emerged. Subsequently, these codes were categorized into more comprehensive thematic categories that accurately represented the data's common patterns and relationships. All authors involved in this study have consented to these codes.

Figure 1: The Flow Diagram of the Review



Source: Adapted from Shaffril et al. (2020)

4. Results and Findings

Finally, this literature analysis has comprehensively reviewed 14 scholarly articles. Within the five years between 2018 and 2022, there has been a significant focus in academic research on the adoption of digital technologies within micro businesses. As evidenced by the findings presented in Table 3, most of the studies examined in this research focused on Information and Communication Technology (ICT) as the primary technological domain, including computer hardware, software, and networks. This was followed by investigations into e-commerce, social media, digital media, e-wallet services, innovation platforms, and one non-digital technology, the alternative energy source in the form of a solar home system.

Table 3: Technologies Examined in the Literature

Innovation/ Technologies	References	Themes
Social media Digital media. E-Commerce, M-Commerce E-Wallet service ICT	(Alharthi & Alhothali, 2021) (Camilleri, 2019) (Salazar et al., 2022); (Pipitwanichakarn & Wongtada, 2019); (Yusoff et al., 2021) (Gichuki & Mulu-Mutuku, 2018) (Crittenden et al., 2019); (Sardar et al., 2021); (Handoko et al., 2019); (Chatterjee et al., 2020); (Afolayan & de la Harpe, 2020); (Aryanathu & Venkata Ravi, 2021); (Segares, 2021)	Digital technologies
Solar home systems	(Kurata et al., 2018)	alternative energy sources, technologies

Through a thorough analysis of the accessible data, it can be discerned that the factors influencing the adoption of technological innovation in micro-businesses can be categorized into two distinct components: the internal factors of individual and external factors encompassing innovation attributes and social influence. A concise overview of the themes identified within each factor is presented in Table 4.

Table 4: Themes Identified

Studies	Region	Internal Antecedents				External Antecedents		
		K	EL	PT	AT	PU	PEOU	SI
(Afolayan & de la Harpe, 2020)	South Africa	/						
(Gichuki & Mulu-Mutuku, 2018)	Kenya	/	/					
(Salazar et al., 2022)	Costa Rica			/		/	/	
(Yusoff et al., 2021)	Malaysia			/				
(Chatterjee et al., 2020)	India				/			
(Aryanathu & Venkata Ravi, 2021)	India					/		
(Camilleri, 2019)	Europe					/		
(Handoko et al., 2019)	Indonesia					/	/	
(Kurata et al., 2018)	Bangladesh					/		
(Pipitwanichakarn & Wongtada, 2019)	Thailand					/	/	
(Sardar et al., 2021)	Pakistan					/	/	
(Alharthi & Alhothali, 2021)	Saudi Arabia					/	/	
(Segares, 2021)	United States							/
(Crittenden et al., 2019)	South Africa					/	/	

Internal Antecedents	External Antecedents
K: Knowledge	**PU**: Perceived Usefulness

EL: Education Level	**PEOU**: Perceived Ease of Use
PT: Psychological Traits	**SI**: Social Influence
AT: Access to Technology	

Internal factors of the individual

The internal factors of the individual significantly influence the adoption decisions made by micro-businesses, whether they are made by the owners or the managers. These characteristics encompass factors such as knowledge, level of education, authority, and psychological traits.

Knowledge as a Catalyst for Innovation Adoption: One of the fundamental internal factors that greatly impact technological innovation adoption in microbusinesses is the level of knowledge possessed by individuals involved in the decision-making process. Knowledge acts as a catalyst, facilitating the recognition of new opportunities and understanding the potential benefits of technological innovations (Tortoriello et al., 2015). According to Afolayan and de la Harpe (2020), it is evident that small firms often rely on anecdotal knowledge derived from their judgment, communication habits, and past experiences when making decisions to adopt new technologies. The owners and managers who deeply understand the industry, market trends, and emerging technologies are more likely to make informed and forward-thinking adoption decisions. With extensive knowledge, these individuals can assess the relevance of a particular innovation to their business operations, leading to quicker and more confident adoption.

Moreover, they are better equipped to navigate the complexities and potential risks associated with adopting new technologies. In contrast, individuals lacking in knowledge may approach technological innovations skeptically, fearing the potential disruptions they may bring. This finding further highlights the pivotal role of continuous learning and industry-specific knowledge in fostering a culture of innovation within micro businesses.

The Significance of Education Levels: Education levels represent another critical internal factor influencing technological innovation adoption in microbusinesses. Gichuki and Mulu-Mutuku (2018) suggest that the level of education is likely to influence the extent of awareness and adoption of these technologies. Owners and managers with higher levels of formal education are often more receptive to change and innovation. Formal education equips individuals with problem-solving skills and instills a mindset that is open to new ideas and experiences.

This finding is in line with other studies conducted specifically within this realm. For example, Burbules et al. (2020) have shown that acquiring knowledge and skills via education has a pivotal role in shaping the future well-being of individuals and the long-term viability of the global ecosystem. This proactive approach to knowledge acquisition can lead to a greater willingness to adopt innovative technologies (Ra et al., 2019) that can enhance efficiency, reduce costs, and improve overall business performance (Walters & Rodriguez, 2017; Tan & Olaore, 2022; Valero, 2021).

Psychological Traits: The Human Element: Beyond knowledge and education, the psychological traits of individuals are crucial determinants of technological innovation adoption within microbusinesses. Risk tolerance and a propensity for innovation significantly shape an individual's attitude toward change and innovation. Yusoff et al. (2021) argue that individuals' evaluations of an innovation's ease of use and usefulness are shaped by their motivation for achievement and propensity for risk-taking. Those who are risk-averse may be hesitant to invest in unproven technologies, whereas others with a higher tolerance for risk may readily welcome uncertainty and perceive it as a potential avenue for advancement. There exists a substantial correlation between individuals' risk tolerance and their level of education (Grable & Rabbani, 2023; Riepe et al., 2022).

Consequently, these factors significantly determine individuals' inclination to adopt and utilize the innovation. Despite being limited by their lack of experience, individuals still rely on their perceptions, even in situations where they lack prior experience or guidance (Salazar et al., 2022). They possess a natural inclination toward innovation and experimentation and are more likely to seek out and champion new technologies that have the potential to transform their business operations. This underscores the significance of their cognitive

disposition.

Moreover, the individual needs to exhibit a level of proficiency in managing the various aspects of the business, particularly in the realm of finance, to make an informed decision regarding adoption, as highlighted by Gichuki and Mulu-Mutuku (2018). Possessing business nous, better referred to as entrepreneurship skill, is important in navigating the business apart from other skills required to propel the business further (Gerig, 2018; Guzmán et al., 2020; Jardim, 2021).

Access to Technology: As these microenterprises strive to navigate the intricacies of the current business environment, the extent to which they can acquire and harness technology plays a crucial role in determining their competitiveness and growth prospects. Access to technology is undeniably a fundamental internal factor that significantly influences technological innovation adoption in micro businesses. Access can be conceptualized as the provision of opportunities to utilize various resources and information that not only encompasses financial resources, which is the key component that collectively determines the feasibility and ease with which micro businesses can adopt new technologies, but also covers aspects like mental access, material access, skill, and usage access (Chatterjee et al., 2020). While material access means access to technology, the other aspects relate to the root influence of knowledge on the efficacy of utilizing the technology.

External Factors

The constructs of the Technology Acceptance Model (TAM) have frequently been identified as a significant determinant of innovation adoption, with particular emphasis on technological attributes, as noted by Handoko et al. (2019) and Pipitwanichakarn and Wongtada (2019). In most of the gathered publications, perceived usefulness and ease of use were identified as the primary factors influencing adoption, compared to other characteristics.

Perceived Usefulness: The perceived usefulness of a technological innovation represents a fundamental external factor that influences microbusinesses' adoption decisions. Rooted in the TAM, this construct posits that individuals and organizations are more likely to adopt a technology if they perceive it as beneficial and advantageous to their goals and operations. The consensus among micro-businesses is that technological progress is expected to enhance operational efficiency and facilitate future business expansion (Aryanathu & Venkata Ravi, 2021; Salazar et al., 2022). According to Kurata et al. (2018), even implementing a basic innovation such as a solitary solar-powered bulb, which consumes less energy and is cost-effective, has the potential to enhance the fundamental functionality of the business operation.

Furthermore, perceived usefulness extends beyond mere cost-benefit analysis. It encompasses the broader strategic implications of technology adoption. For instance, the integration of ICT in business has been driven by its ability to facilitate social connections with the marketplace, stakeholders (Camilleri, 2019), and customers (Crittenden et al., 2019), as well as its cost-effective expansion of the corporate network (Sardar et al., 2021). The significance of the strategic aspect of perceived usefulness highlights the necessity of adopting a comprehensive approach to evaluating technology. In this context, micro businesses consider not only immediate benefits but also future growth potential from adopting technologies.

Perceived Ease of Use: Within the TAM framework, perceived ease of use pertains to the degree to which individuals believe utilizing a specific technology would be devoid of exertion and complexities. Technologies that can be effortlessly integrated into established workflows and need minimum interruption to everyday routines are more inclined to be embraced (Saghafian et al., 2021). In contrast, complex and cumbersome systems may deter adoption as they impose additional training, maintenance, and troubleshooting costs. This element gains notable importance in microbusinesses, where the availability of time and money is limited. Hence, from the gathered publication, it is evident that the accessibility and user-friendliness of the technologies (Alharthi & Alhothali, 2021; Crittenden et al., 2019; Handoko et al., 2019; Pipitwanichakarn & Wongtada, 2019; Salazar et al., 2022), coupled with the absence of a need for specialized training (Sardar et al., 2021) appeal the micro businesses to adopt.

Social Influence: The presence of social influence and its role in fostering a supportive atmosphere is a critical

factor that has been well-documented in gathered research on technological innovation adoption within micro businesses. Studies by Alharthi and Alhothali (2021) and Segares (2021) have shed light on the profound impact of social influence on the adoption decisions made by these small-scale enterprises. When stakeholders within the microbusiness, including owners, managers, and employees, are positively influenced by their peers or industry networks, they are more likely to perceive technology adoption as a valuable endeavor, especially to connect with their customers (Alharthi & Alhothali, 2021).

Within the microbusiness community, word-of-mouth recommendations and endorsements carry significant weight. When one micro business owner or manager shares their positive experiences with a particular technology solution, it can influence others to consider and adopt the same technology (Alharthi & Alhothali, 2021). While there is no direct positive correlation with adoption intention, it indirectly promotes the development of positive adoption intention by mitigating user resistance (Yoo et al., 2021). Thus, it is no wonder that social influence has been integrated into many major foundational theoretical frameworks of technology adoption research, including the Theory of Planned Behavior (TPB) (Ajzen, 1991), the Technology Acceptance Model 2 (TAM2) (Venkatesh & Davis, 2000), and the Unified Theory of Acceptance and Use of Technology (UTAUT) (Venkatesh et al., 2003).

5. Conclusion and Recommendations

One of the key findings from this review highlights multifarious antecedents that stimulate technological innovation in microbusinesses, which is contingent upon the specific technology being examined in each article. The finding uncovered the human attribute that significantly influences micro-enterprise decision-making compared to bigger organizations. It corroborated the conclusions put forth by Barroga et al. (2019) and Elbeltagi et al. (2013), which emphasize the importance of incorporating individual and organizational-level analyses when investigating the adoption of innovation in micro-businesses, given that micro-business decisions are primarily driven by their owners. Furthermore, it is worth noting that there is presently a lack of consensus regarding the determinants that ultimately influence the adoption of technological innovation in micro businesses. This argument is justified due to the extensive examination of technological innovations in diverse contexts, each characterized by distinct theoretical frameworks and conducted with varied participant demographics. The complexity is further heightened because the technological innovation being examined possesses its own distinct set of attributes and applications, as is evident in the unique qualities of both digital and non-digital technologies. It is, therefore, no trifling matter that the identified antecedents have established a robust foundation for further inquiry and academic discourse on the adoption of technological innovations by microbusinesses to amplify the growing body of knowledge in this field of study.

Nevertheless, one suggestion that can be made to enhance the adoption of technological innovation among microbusinesses is for the policymakers and industry stakeholders to implement training programs focusing on technology integration in business. These programs should be designed to address the knowledge gap identified in this study, providing microbusiness owners with an added understanding of the importance of technological innovation for their business. Additionally, these programs may include mentorship initiatives, connecting micro business owners with technology adopters in similar industries to foster peer learning and reduce adoption hesitancy. The government, specifically, may introduce financial incentives that subsidize access to essential technological innovations to further encourage micro businesses to integrate technological solutions into their operations.

Limitations: As with any other study based on a literature review, one of the key limitations of this current study on factors influencing microbusinesses' technological innovation adoption is the temporal scope of the study. Given the rapid pace at which new research is published, particularly in the dynamic field of innovation adoption, it is inherently challenging to include the latest publications. The data collected for this study is restricted to the period it was written. Therefore, no studies published beyond that time have been taken into account. By excluding the most recent research, our present evaluation may overlook the newest advancements and lose the opportunity to comprehensively represent the current state of knowledge. It can also lead to a gap in capturing the most recent empirical data that could be critical for understanding contemporary practices of micro businesses. Such omissions might affect the relevance and applicability of the findings.

Another notable limitation of this study is that the literature search was limited to three databases: Scopus, Web of Science, and ScienceDirect. While these databases are reputable and comprehensive, providing a wide range of excellent scientific publications, confining the search to these platforms narrows the breadth or scope of the literature review. Moreover, by not including other potential databases, there is a risk of omitting relevant studies, particularly those published in journals or conference proceedings not indexed by Scopus, Web of Science, or ScienceDirect. That said, by broadening the database scope, the current review could have been more holistic in understanding the factors that influence technological innovation adoption among micro businesses. Including a variety of databases, the research would be able to encompass a broader range of viewpoints and findings, thus enriching the overall analysis and conclusions of the study. Consequently, the review might not fully capture the diversity of experiences, strategies, and outcomes related to innovation adoption across different contexts and periods.

In summary, while the systematic approach taken in this review offers a structured and detailed examination of existing literature, these limitations should be acknowledged to ensure that readers understand the scope and boundaries of the study. Acknowledging these limitations helps to contextualize the study's contributions and underscores the need for ongoing research in this evolving field. As for suggestions, to resolve these limitations, future research should incorporate a broader range of databases and must not stop replicating to continuously update the literature to include the most recent studies. This would result in a more comprehensive and up-to-date analysis of technological innovation adoption, particularly among micro businesses.

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References

Afolayan, A. O., & de la Harpe, A. C. (2020). The role of evaluation in SMMEs' strategic decision-making on new technology adoption. *Technology Analysis and Strategic Management*, 32(6), 697–710. https://doi.org/10.1080/09537325.2019.1702637

Ajzen, I. (1991). The theory of planned behavior. Organizational Behavior and Human Decision Processes, 50(2), 179–211. https://doi.org/10.1016/0749-5978(91)90020-T

Alharthi, A. A., & Alhothali, G. T. (2021). The Adoption of Social Media Marketing by Home-based Businesses in Saudi Arabia. *Marketing and Management of Innovations*, 5(3), 252–263. https://doi.org/10.21272/mmi.2021.3-21

Anton, T. S., Trupp, A., Stephenson, M. L., & Chong, K. L. (2023). The Technology Adoption Model Canvas (TAMC): A Smart Framework to Guide the Advancement of Microbusinesses in Emerging Economies. *Smart Cities*, 6(6), 3297-3318. https://doi.org/10.3390/smartcities6060146

Aryanathu, V., & Venkata Ravi, R. (2021). Women Entrepreneurship and Information Communication Technology - Case Studies from Kollam District. *International Education & Research Journal*, 7(7), 11–14.

Australian Bureau of Statistics. (2012). *Australian Small Business Key Statistics and Analysis*. Department of Industry, Innovation, Science, Research and Tertiary Education. https://treasury.gov.au/sites/default/files/2019-03/AustralianSmallBusinessKeyStatisticsAndAnalysis.docx

Azmi, E. A. A. E. M. (2020). Small Medium Enterprises (SMEs) business owners' well-being and business growth in Malaysia. *Malaysian Journal of Society and Space*, 16(4), 296–310. https://doi.org/10.17576/geo-2020-1604-22

Bain & Company. (2021). *The Platform Economy: Southeast Asia's Digital Growth Catalyst Table of Contents*. https://techforgoodinstitute.org/wp-content/uploads/2021/10/UPDATED_TFGI-Bain_Full-Report.pdf

Barroga, K. D., Rola, A. C., Depositario, D. P. T., Digal, L. N., & Pabuayon, I. M. (2019). Determinants of the extent of technological innovation adoption among micro, small, and medium food processing enterprises in Davao Region, Philippines. *Philippine Journal of Science*, 148(4), 825–839.

Borowski, P. F. (2021). Innovation strategy on the example of companies using bamboo. In *Journal of Innovation and Entrepreneurship,* 10(1). https://doi.org/10.1186/s13731-020-00144-2

Braun, V. & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative Research in Psychology*, 3(2), 77-101. https://doi.org/10.1191/1478088706qp063oa

Burbules, N. C., Fan, G., & Repp, P. (2020). Five trends of education and technology in a sustainable future. *Geography and Sustainability*, 1(2), 93–97. https://doi.org/10.1016/j.geosus.2020.05.001

Camilleri, M. A. (2019). The SMEs' technology acceptance of digital media for stakeholder engagement. *Journal of Small Business and Enterprise Development*, 26(4), 504–521. https://doi.org/10.1108/JSBED-02-2018-0042

Chatterjee, S., Dutta Gupta, S., & Upadhyay, P. (2020). Technology adoption and entrepreneurial orientation for rural women: Evidence from India. *Technological Forecasting and Social Change*, 160(August). https://doi.org/10.1016/j.techfore.2020.120236

Clarke, V. & Braun, V. (2017). Thematic analysis. The Journal of Positive Psychology, 12(3), 297-298.

Claudino, T. B., Santos, S. M. dos, Cabral, A. C. de A., & Pessoa, M. N. M. (2017). Fostering and limiting factors of innovation in Micro and Small Enterprises. In *RAI Revista de Administração e Inovação,* 14(2), 130–139). https://doi.org/10.1016/j.rai.2017.03.007

Crittenden, V. L., Crittenden, W. F., & Ajjan, H. (2019). Empowering women micro-entrepreneurs in emerging economies: The role of information communications technology. *Journal of Business Research*, 98(May 2018), 191–203. https://doi.org/10.1016/j.jbusres.2019.01.045

Dorrington, P., Lacan, F., & Bigot, S. (2016). How are micro enterprises adopting emergent technologies? In *Sustainable Design and Manufacturing* 2016 (pp. 215-226). Springer International Publishing. https://doi.org/10.1007/978-3-319-32098-4_19

Elbeltagi, I., Al Sharji, Y., Hardaker, G., & Elsetouhi, A. (2013). The role of the owner-manager in SMEs' adoption of information and communication technology in the United Arab Emirates. *Journal of Global Information Management*, 21(2), 23–50. https://doi.org/10.4018/jgim.2013040102

Eliakis, S., Kotsopoulos, D., Pramatari, K., & Karagiannaki, A. (2020). Survival and growth in innovative technology entrepreneurship: A mixed-methods investigation. *Administrative Sciences*, 10(3). https://doi.org/10.3390/admsci10030039

European Union (2024). SME Definition. Retrieved January 20, 2025, from https://single-market-economy.ec.europa.eu/smes/sme-fundamentals/sme-definition_en

Fallon-O'Leary, D. (2024, February 7). Micro-Businesses and Startups: key differences. CO- by US Chamber of Commerce. https://www.uschamber.com/co/start/startup/micro-businesses-vs-startups

Gerig, S. (2018). Skills That Small Business Owners Use to Succeed Beyond 5 Years. Walden University.

Gichuki, C. N., & Mulu-Mutuku, M. (2018). Determinants of awareness and adoption of mobile money technologies: Evidence from women micro entrepreneurs in Kenya. *Women's Studies International Forum*, 67(November 2017), 18–22. https://doi.org/10.1016/j.wsif.2017.11.013

Grable, J. E., & Rabbani, A. (2023). The Moderating Effect of Financial Knowledge on Financial Risk Tolerance. *Journal of Risk and Financial Management*, 16(2). https://doi.org/10.3390/jrfm16020137

Grabowska, M. (2015). Innovativeness in Business Models. *Procedia Computer Science*, 65, 1023–1030. https://doi.org/10.1016/j.procs.2015.09.057

Guzmán, V. E., Muschard, B., Gerolamo, M., Kohl, H., & Rozenfeld, H. (2020). Characteristics and Skills of Leadership in the Context of Industry 4.0. *Procedia Manufacturing*, 43, 543–550. https://doi.org/10.1016/j.promfg.2020.02.167

Handoko, B. L., Soepriyanto, G., & Lin Lindawati, A. S. (2019). Technology acceptance model on micro business owners in Grogol Petamburan district. *ACM International Conference Proceeding Series*, 271–276. https://doi.org/10.1145/3335484.3335498

Jardim, J. (2021). Entrepreneurial skills to be successful in the global and digital world: Proposal for a frame of reference for entrepreneurial education. *Education Sciences*, 11(7). https://doi.org/10.3390/educsci11070356

Jiang, S. & Li, J. (2021). Global climate governance in the new era: Potential of business actors and technological innovation. *Chinese Journal of Population, Resources and Environment*. 18. 10.1016/j.cjpre.2021.04.023.

Jimenez-Mavillard, A. & Suarez, J. L. (2020). Diffusion of elBulli's innovation: Rate of adoption in Allrecipes and Epicurious. *International Journal of Gastronomy and Food Science*, 22(April). https://doi.org/10.1016/j.ijgfs.2020.100243

Jocevski, M., Ghezzi, A., & Arvidsson, N. (2020). Exploring the growth challenge of mobile payment platforms: A business model perspective. *Electronic Commerce Research and Applications*, 40(April 2019), 100908. https://doi.org/10.1016/j.elerap.2019.100908

Jonek-Kowalska, I. (2021). Research institutes in Poland as an element of the national innovation system—complexity, financing and effectiveness. J*ournal of Open Innovation: Technology, Market, and Complexity*, 7(2). https://doi.org/10.3390/joitmc7020162

Juniarti, R. P., & Omar, A. (2021). Technology adoption in Small and Medium Enterprises (SMEs): current issues and future research avenues. *Proceedings of the BISTIC Business Innovation Sustainability and Technology International Conference* (BISTIC 2021), 193(Bistic), 91–101.

Karr, J., Loh, K., & Wirjo, A. (2020). Supporting MSMEs Digitalization Amid Covid-19. APEC Policy Support Unit Policy Brief, 35. https://mail.sea-vet.net/images/seb/e-library/doc_file/743/220psusupporting-msmes-digitalization-amid-covid-19.pdf

Kruger, S. & Steyn, A. (2022). Assessing Technology Adoption Constructs that Enable Organizations to Navigate the Fourth Industrial Revolution: A Systematic Review. *SSRN Electronic Journal*. 10.2139/ssrn.4105417.

Kung, S. (2021). Critical theory of technology and actor-network theory in the examination of techno-empowered online collaborative translation practice. Babel. Revue Internationale De La Traduction / *International Journal of Translation*, 67(1), 75-98. https://doi.org/10.1075/babel.00206.kun

Kurata, M., Matsui, N., Ikemoto, Y., & Tsuboi, H. (2018). Do determinants of adopting solar home systems differ between households and micro-enterprises? Evidence from rural Bangladesh. *Renewable Energy*, 129, 309–316. https://doi.org/10.1016/j.renene.2018.06.015

Lee, C., Hallak, R., & Sardeshmukh, S. R. (2019). Creativity and innovation in the restaurant sector: Supply-side processes and barriers to implementation. *Tourism Management Perspectives*, 31(July 2018), 54–62. https://doi.org/10.1016/j.tmp.2019.03.011

Martínez-Peláez, R., Ochoa-Brust, A., Rivera, S., Félix, V. G., Ostos, R., Brito, H., Félix, R. A., & Mena, L. J. (2023). Role of Digital Transformation for Achieving Sustainability: Mediated Role of Stakeholders, Key Capabilities, and Technology. *Sustainability* (Switzerland), 15(14). https://doi.org/10.3390/su151411221

Mengist, W., Soromessa, T., & Legese, G. (2020). Method for conducting systematic literature review and meta-analysis for environmental science research. *MethodsX*, 7, 100777. https://doi.org/10.1016/j.mex.2019.100777

Ministry of Micro, Small & Medium Enterprises. (2020). What's MSME? https://msme.gov.in/know-about-msme

Moghavvemi, S., Mei, T. X., Phoong, S. W., & Phoong, S. Y. (2021). Drivers and barriers of mobile payment adoption: Malaysian merchants' perspective. *Journal of Retailing and Consumer Services*, 59(March 2020), 102364. https://doi.org/10.1016/j.jretconser.2020.102364

Mukta, R. T., Rayhan, Z., & Faruq, O. (2024). A strategy for development and economic progress: challenges and opportunities of rural entrepreneurship. Информатика Экономика Управление - *Informatics Economics Management*, 3(4), 0401–0417. https://doi.org/10.47813/2782-5280-2024-3-4-0401-0417

Organization for Economic Co-operation and Development (OECD). (2017). Enhancing the contributions of SMEs in a global and digitalized economy. Dari: https:// www.oecd.org/mcm/documents/C-MIN-2017-8-EN.pdf. In Meeting of the OECD Council at Ministerial Level (Issue 1).

Osei, B. A., Ragavan, N. A., Kandappan, B., & Frempong, F. (2022). Exploring measures to enhance the low adoption rate of IR 4.0 technologies: a qualitative inquiry with hotels during COVID-19. European *Journal of Innovation Management*, 27(5), 1547–1574. https://doi.org/10.1108/ejim-09-2022-0484

Pang, S., Dou, S., & Li, H. (2020). Synergy effect of science and technology policies on innovation: Evidence from China. *PLoS ONE*, 15(October 10), 1–19. https://doi.org/10.1371/journal.pone.0240515

Phuangrod, K., Lerkiatbundit, S., & Aujiraponpan, S. (2017). Factors affecting innovativeness of small and medium enterprises in the five southern border provinces. In *Kasetsart Journal of Social Sciences* 38(3), 204–211). https://doi.org/10.1016/j.kjss.2016.07.008

Pipitwanichakarn, T., & Wongtada, N. (2019). Leveraging the technology acceptance model for mobile commerce adoption under distinct stages of adoption: A case of micro businesses. *Asia Pacific Journal of Marketing and Logistics*, 33(6), 1415–1436. https://doi.org/10.1108/APJML-10-2018-0448

Pougnet, S., Martin-Rios, C., & Pasamar, S. (2022). Keg wine technology as a service innovation for sustainability in the foodservice industry. *Journal of Cleaner Production*, 360(May). https://doi.org/10.1016/j.jclepro.2022.132145

Ra, S., Shrestha, U., Khatiwada, S., Yoon, S. W., & Kwon, K. (2019). The rise of technology and its impact on skills. *International Journal of Training Research*, 17(sup1), 26–40. https://doi.org/10.1080/14480220.2019.1629727

Räisänen, J. & Tuovinen, T. (2020). 8. Digital innovations in rural micro-enterprises. *Journal of Rural Studies*, Vol. 73, 56-67, doi: 10.1016/J.JRURSTUD.2019.09.010

Reuschl, A. J., Deist, M. K., & Maalaoui, A. (2022). Digital transformation during a pandemic: Stretching the organizational elasticity. *Journal of Business Research*, 144, 1320–1332. https://doi.org/10.1016/j.jbusres.2022.01.088

Riepe, J., Rudeloff, M., & Veer, T. (2022). Financial literacy and entrepreneurial risk aversion. *Journal of Small Business Management*, 60(2), 289–308. https://doi.org/10.1080/00472778.2019.1709380

Saghafian, M., Laumann, K., & Skogstad, M. R. (2021). Stagewise Overview of Issues Influencing Organizational Technology Adoption and Use. *Frontiers in Psychology*, 12(March), 1–23. https://doi.org/10.3389/fpsyg.2021.630145

Salazar, M. B., Marín-Raventós, G., & Herrera, G. L. (2022). Designing Diagnosis Instruments to Determine E-Commerce Readiness for Micro and Small Enterprises in Rural Areas. *CLEI Eletronic Journal* (CLEIej), 25(2), 11. https://doi.org/10.19153/CLEIEJ.25.2.11

Santos, V., Sousa, M. J., Costa, C., & Au-Yong-Oliveira, M. (2021). Tourism towards Sustainability and Innovation: A Systematic Literature Review. *Sustainability*, 13(20), 11440. https://doi.org/10.3390/su132011440

Sardar, T., Jianqiu, Z., Bilal, M., & Syed, N. (2021). Impact of ICT on entrepreneurial self-efficacy in emerging economy: Sustaining lockdown during the COVID-19 pandemic. *Human Systems Management*, 40(2), 299–314. https://doi.org/10.3233/HSM-201066

Scherer, F. M. (2001). Innovation and Technological Change, Economics of (N. J. Smelser & P. B. B. T.-I. E. of the S. & B. S. Baltes (Eds.); 530–7536. Pergamon. https://doi.org/https://doi.org/10.1016/B0-08-043076-7/02308-1

Segares, M. (2021). Crochet microentrepreneurs and technology: A collective case study. Craft Research, 12, 275–293. https://doi.org/10.1386/crre_00053_1

Shaffril, H. A. M., Ahmad, N., Samsuddin, S. F., Samah, A. A., & Hamdan, M. E. (2020). Systematic literature review on adaptation towards climate change impacts among indigenous people in the Asia Pacific regions. *Journal of Cleaner Production*, 258, 120595. https://doi.org/10.1016/j.jclepro.2020.120595

Shin, K., Kim, E., & Jeong, E. S. (2018). Structural relationship and influence between open innovation capacities and performances. *Sustainability* (Switzerland), 10(8), 1–18. https://doi.org/10.3390/su10082787

SME Corp. Malaysia. (2020). Guideline For SME Definition. SME Corp. Malaysia, 1–13.

Snyder, H. (2019). Literature review as a research methodology: An overview and guidelines. In *Journal of Business Research*, 104, 333–339. https://doi.org/10.1016/j.jbusres.2019.07.039

Stylos, N., Fotiadis, A. K., Shin, D. (Don), & Huan, T. C. T. (2021). Beyond smart systems adoption: Enabling diffusion and assimilation of smartness in hospitality. *International Journal of Hospitality Management*, 98(November 2020), 103042. https://doi.org/10.1016/j.ijhm.2021.103042

Sullivan, Y. & Wamba, S. F. (2024). Artificial intelligence and adaptive response to market changes: A strategy to enhance firm performance and innovation, *Journal of Business Research*, 174, https://doi.org/10.1016/j.jbusres.2024.114500.

Surya, B., Menne, F., Sabhan, H., Suriani, S., Abubakar, H., & Idris, M. (2021). Economic growth, increasing productivity of SMEs, and open innovation. *Journal of Open Innovation: Technology, Market, and Complexity*, 7(1), 1–37. https://doi.org/10.3390/joitmc7010020

Tan, F. Z., & Olaore, G. O. (2022). Effect of organizational learning and effectiveness on the operations, employees' productivity and management performance. *Vilakshan - XIMB Journal of Management*, 19(2), 110–127. https://doi.org/10.1108/xjm-09-2020-0122

Tortoriello, M., McEvily, B., & Krackhardt, D. (2015). Being a catalyst of innovation: The role of knowledge diversity and network closure. *Organization Science*, 26(2), 423–438. https://doi.org/10.1287/orsc.2014.0942

Valero, A. (2021). Education and management practices. *Oxford Review of Economic Policy*, 37(2), 302–322. https://doi.org/10.1093/oxrep/grab006

Vassar, M., Yerokhin, V., Sinnett, P. M., Weiher, M., Muckelrath, H., Carr, B., Varney, L., & Cook, G. (2017). Database selection in systematic reviews: an insight through clinical neurology. *Health Information & Libraries Journal*, 34(2), 156–164. https://doi.org/10.1111/hir.12176

Venkatesh, V., & Davis, F. D. (2000). A Theoretical Extension of the Technology Acceptance Model: Four Longitudinal Field Studies. *Management Science*, 46(2), 186–204. http://www.jstor.org/stable/2634758

Venkatesh, V., Morris, M. G., Davis, G. B., & Davis, F. D. (2003). User Acceptance of Information Technology: Toward a Unified View. *MIS Quarterly*, 27(3), 425–478.

Walters, K., & Rodriguez, J. (2017). The Importance of Training and Development in Employee Performance and Evaluation. *World Wide Journal of Multidisciplinary Research and Development*, 3, 206-212.

Yoo, J., Choi, S., Hwang, Y., & Yi, M. Y. (2021). The role of user resistance and social influences on the adoption of smartphones: Moderating effect of age. *Journal of Organizational and End User Computing*, 33(2), 36–58. https://doi.org/10.4018/JOEUC.20210301.oa3

Younger, P. (2010). learning zone Using Google Scholar to conduct research. *Nursing Standard*, 24(45), 40–46.

Yusoff, M. N. H. Bin, Zainol, F. A., Ridzuan, R. H., Ismail, M., & Afthanorhan, A. (2021). Psychological traits and intention to use e-commerce among rural micro-entrepreneurs in Malaysia. J*ournal of Theoretical and Applied Electronic Commerce Research*, 16(5), 1827–1843. https://doi.org/10.3390/jtaer16050102

Zhang, H., Wen, J., Chen, X., Ge, Y., & Chen, Y. (2022). Intelligent System Construction Paths for Digitalization Process of Real Economy: A Study from the Perspective of Artificial Intelligence and Platform Leverage. *Scientific Programming*, 2022. https://doi.org/10.1155/2022/1027211

Zhang, Y., Khan, U., Lee, S., & Salik, M. (2019). The influence of management innovation and technological innovation on organization performance. A mediating role of sustainability. *Sustainability* (Switzerland), 11(2). https://doi.org/10.3390/su11020495