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Exploring the Role of Digital Tools in Enhancing Innovation and Competitiveness Among Micro-Enterprises in Malaysia

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Abstract

Digital transformation has emerged as a critical driver of economic growth, yet marginalised micro-enterprises often face significant barriers to adopting digital tools. This study explores the readiness of marginalised micro-enterprises in Malaysia for digital transformation, with a focus on identifying key challenges, enablers, and their implications for innovation and growth. Adopting a qualitative research approach, data were collected through semi-structured interviews with micro-entrepreneurs across diverse sectors. Thematic analysis revealed recurring barriers, including limited access to digital infrastructure, lack of technical skills, and resource constraints. Conversely, factors such as government support programs, peer networks, and mobile technology were identified as key enablers. The findings underscore the importance of tailored capacity-building initiatives and policy interventions to bridge the digital divide. This study contributes to the growing body of knowledge on digital transformation by offering practical insights into the unique needs of marginalised enterprises and strategies to foster their inclusion in the digital economy.

Keywords: *Digital transformation, marginalised micro-enterprises, Malaysia, qualitative research, innovation, digital readiness.*

1. Introduction

The adoption of digital tools has become crucial for the survival and growth of micro-enterprises in Malaysia. With the rapid evolution of digital technologies, e-commerce platforms, mobile payments, and digital marketing tools, businesses are increasingly leveraging these resources to improve efficiency, expand market reach, and enhance customer engagement (Hanafi, 2022). For micro-enterprises, which often have limited resources, digital adoption can present a pathway to growth and competitiveness in the global market. The Malaysian government has recognized this potential, introducing initiatives like the Malaysia Digital Economy Blueprint to encourage digital transformation among micro, small, and medium-sized enterprises (SMEs) (Ministry of Communications and Multimedia Malaysia, 2020). However, despite these efforts, a significant gap remains in the extent to which micro-enterprises adopt and utilize these technologies.

1.1 Problem Statement

The pervasive trend of digitalization is profoundly transforming the business landscape across global markets, manifesting its influence across various sectors and demographics. This transformation is not merely confined to large multinational corporations; small businesses regardless of their location in urban or rural settings are increasingly confronted with the imperative to adapt to a digital economy. Research indicates that the adoption of digital

technologies is no longer optional for businesses seeking sustainable growth, competitive advantage, and resilience in an ever-evolving market environment. Small enterprises are particularly vulnerable during this transition, facing an array of challenges including limited financial resources, a lack of technical expertise, and insufficient access to advanced digital tools (Nor, Hanafi & Saidatul, 2023).

In urban areas, small businesses may struggle with high competition and the need to differentiate themselves in a saturated market while simultaneously integrating digital solutions to enhance their operations and customer engagement. Conversely, those in rural settings often encounter unique obstacles such as inadequate internet connectivity, reduced access to technological innovations, and demographic constraints, which can hinder their ability to fully leverage digitalization (Nor, Hanafi & Saidatul, 2023). The implications of this digital divide are significant. Failure to adapt can lead to diminished market relevance, reduced operational efficiency, and ultimately, business failure. Therefore, understanding the factors that influence successful digital adoption among small businesses is critical for policymakers, business leaders, and researchers alike (Hanafi & Ahmad, 2021). Comprehensive strategies must be developed to support small enterprises in navigating this complex digital landscape, promoting not only their survival but also their potential for growth in the digital age.

Many micro-enterprises in Malaysia face substantial barriers to adopting digital tools. Financial limitations, lack of digital skills, and limited access to affordable technologies hinder their capacity to implement digital solutions (Koh et al., 2021). Moreover, cultural factors, including resistance to change and unfamiliarity with digital tools, further complicate the adoption process (Zhang & Lee, 2019). These challenges not only limit their growth potential but also prevent them from staying competitive in an increasingly digital marketplace.

The ongoing digital evolution necessitates a proactive approach among small businesses to embrace technological advancements, ensuring that they remain viable participants in a competitive marketplace. This calls for targeted interventions that address the specific needs and challenges faced by these businesses, ultimately fostering a more inclusive digital economy.

1.2 Objectives

This study aims to explore the key barriers and benefits associated with the adoption of digital tools among micro-enterprises in Malaysia. Specifically, it will assess the readiness of these businesses to embrace digital transformation, the impact of digital tools on business innovation, and the factors influencing adoption. By addressing these objectives, this research will contribute valuable insights into how micro-enterprises can overcome digital adoption challenges and enhance their competitiveness.

1.3 Research Questions

- What are the key factors influencing the adoption of digital tools by micro-enterprises in Malaysia?
- How do digital tools impact business performance and innovation within these enterprises?
- What are the main barriers and enablers of digital adoption in Malaysian micro-enterprises?

2. Literature Review

Microenterprises have positively impacted developing nations, helping them progress despite limited support from civil and commercial organizations (De Soto 1989). These businesses have also aided in job creation by providing opportunities to those unable to find jobs while

helping eliminate poverty through profitability (Hanafi et al., 2023). Microenterprises also provide more affordable goods and services to the community because they are usually lower in price (Kirkpatrick and Hulme 2001). Given the positive impact of microenterprises and the limited studies on microenterprise performance, the purpose of this study is to examine the factors that affect and shape microenterprise performance. Specifically, proactive management activities directly linked to the daily operations of the microenterprise are examined. A growing body of research has examined the adoption of digital tools by micro-enterprises in developing countries, particularly in Malaysia. Many small businesses in Malaysia have been slow to embrace digital transformation due to financial constraints, limited technological knowledge, and cultural resistance to change. While studies indicate that digital tools can enhance operational efficiency, customer engagement, and market access, micro-enterprises often struggle to realize these benefits because of resource limitations and low digital literacy.

The increasing adoption of digital technologies has become a critical factor in driving innovation and enhancing competitiveness among micro-enterprises in Malaysia (Subri et al., 2024). Digital tools have the potential to transform business models, improve efficiency, and enable micro-enterprises to serve their digitally-savvy customers better (Yuen, 2023). One of the significant benefits of digital tools is their ability to enhance the performance of micro-enterprises. Similarly, another study highlighted that the adoption of a new business model that leverages digital technology can help micro-enterprises adapt to unstable environments and achieve sustainable business performance. (Yuen, 2023)

The literature also suggests that micro-enterprises in Malaysia are optimistic about the transformative potential of digital technology, but the level of digital adoption remains relatively low. Many government organizations have attempted to encourage SMEs to modernize their operations through the use of computers, but the results have been limited in terms of process improvement. (Yuen, 2023) To address this challenge, micro-enterprises need to holistically digitalize their business models, incorporating digital technology for communication, promotion, marketing, and service delivery to meet the demands of digitally savvy customers. (Yuen, 2023)

2.1 Research on Malaysian Micro Enterprise

Research on Malaysian Micro Enterprises shows that challenges to digital transformation include financial constraints, technological readiness, and cultural factors. There's a recognized need to improve technological infrastructure and awareness, especially for micro-enterprises lacking resources for comprehensive digital integration. The rise of mobile commerce (m-commerce) among Micro and SMEs is influenced by factors such as performance expectancy and social influence (Subri et al., 2024). While there is research on technology adoption in SMEs, attention to micro-enterprises, particularly in specific sectors like retail or food services—is limited. Additionally, the role of organizational context and environmental factors in driving digital transformation in these smaller businesses warrants further exploration.

Micro-enterprises in Malaysia play a crucial role in the nation's economy, contributing significantly to employment and economic growth. These businesses are typically defined as small-scale ventures with fewer than five employees and annual revenues under RM300,000 (Malaysia Ministry of Finance, 2020). The majority of micro-enterprises operate in sectors such as retail, food services, and manufacturing, often characterized by low capital investment and limited access to advanced technologies. Despite their small size, micro-enterprises are

essential in driving local economies, particularly in rural areas where they provide livelihood opportunities and services that cater to the community's needs.

The growth of micro-enterprises in Malaysia is influenced by several factors, including government support, such as the Malaysia Digital Economy Blueprint (MyDIGITAL), which aims to foster digital transformation and enable SMEs (Small and Medium Enterprises) and micro-enterprises to leverage technology (Ministry of Communications and Multimedia Malaysia, 2020). However, these businesses face unique challenges, including limited access to financing, lack of digital literacy, and insufficient infrastructure, which can impede their ability to scale and compete in an increasingly digital market. Recent studies indicate that while many micro-enterprises in Malaysia are aware of the potential benefits of digital tools, they are often reluctant to adopt them due to concerns about costs, perceived complexity, and insufficient technical skills (Koh et al., 2021). Addressing these barriers through targeted policies, financial support, and training programs is crucial to ensuring the sustainability and competitiveness of micro-enterprises in the digital economy.

2.2 Factors Affecting Microenterprise Success

Microenterprises, defined as small-scale businesses typically employing fewer than ten individuals, can be organised in various forms, including sole proprietorships, partnerships, or family enterprises (Storey, 2016). Their operational modalities are diverse and may evolve throughout the lifecycle of the business. Larson and Shaw (2001) classify micro- and small-enterprises (MSE) along several dimensions:

1. Predominantly family-owned, with familial involvement in day-to-day operations;
2. Often managed by a single individual;
3. Primarily situated in rural locales;
4. Engaged in trading and manufacturing activities;
5. Characterized by high rates of business start-ups and subsequent failures;
6. Frequently established by women;
7. Functioning on a modest scale with lower income generation.

According to Tinker (2000), many microenterprises report gross annual sales of under $25,000, with the primary objective being business survival. Furthermore, a significant proportion of these enterprises operate from home-based settings (Hanafi & Nawi 2019). Key determinants influencing microenterprises' performance include access to microenterprise programs (MEPs), availability of training and external support, and access to financial resources. Understanding these factors is crucial for fostering their growth and sustainability in various economic contexts.

2.3 Microenterprise Support Programs

Microentrepreneurs require a range of business support services, including access to technology and research assistance (Goldmark 2001). Additionally, mentorship can play a particularly beneficial role in microenterprises (Dumas 2001). Companies that receive support services—such as training in management, marketing, information technology, and networking from public or private agencies have shown significant improvements in sales, employment, and productivity (Sarder 2020). However, one study indicated that firms benefiting from credit and other forms of assistance did not outperform those that were less privileged (Mambula et al., 2024). Despite this, government support has proven to be more crucial for the success of local entrepreneurs compared to non-local ones (Yusuf, 2020).

In evaluating the availability, accessibility, and adequacy of support facilities for small businesses in Malaysia, Manan et al., (2023) found that a large portion of small businesses (88.1 %) obtain access to support programs. However, many small businesses do not gain adequate assistance, despite the existence of numerous support programs and involved agencies (Nor, Hanafi & Saidatul 2023). Other challenges faced by SMEs include the inability to adopt technology, lack of market information, difficulties in loan access, a lack of skilled workers, and global competition.

In Malaysia, the development of Small and Medium Enterprises (SMEs), including microenterprises, is supported by a robust framework encompassing 12 ministries and 40 government agencies. These entities collaboratively deliver a diverse array of services tailored to various target groups, thereby fostering a conducive environment for SME growth and sustainability. Key initiatives include the Industrial Linkage Program (ILP), which aims to bolster SMEs' roles as reliable and competitive suppliers of components and services to Large Industries (LIs) and Multinational Corporations (MNCs). The Global Supplier Program (GSP) is designed to enhance the knowledge base and capabilities of SMEs, facilitating their transformation into world-class suppliers of products and services.

Another significant initiative is the Head Start 500 Program, geared towards accelerating the transformation of 500 SMEs into global manufacturers. The Vendor Development Program (VDP) offers continuous consultancy and technical support to SMEs, while the Franchise Development Program (FDP) focuses on cultivating SMEs within the commercial, service, and industrial sectors. Furthermore, the Infrastructure Development Program provides critical assistance to SMEs, enabling them to operate in designated areas or premises. The Skills Upgrading Program aims to enhance the competencies of the workforce, ensuring that employees meet evolving market demands. Outreach and Promotional Programs are implemented to encourage SME participation in developmental programs and financial assistance schemes specifically designed to benefit them.

The SME Information and Advisory Centre serves as a vital resource, enabling SMEs to access information and guidance on various support initiatives and financial aid available from the government. The establishment of SME Experts and Advisory Panels offers businesses the opportunity to engage with experienced industrial experts, facilitating improvements in technological capacities and productivity. Lastly, financial assistance schemes for SMEs provide essential funding through grants and soft loans, complemented by a special assistance scheme aimed at supporting women entrepreneurs. Collectively, these comprehensive programs underscore the Malaysian government's commitment to fostering a vibrant SME sector, which is crucial for the nation’s economic growth and development.

2.4 Limited Research Focus on Specific Sectors

While much of the existing literature extensively addresses digital adoption among SMEs, specific sectors such as retail, food services, and agriculture have been relatively underrepresented in studies. For instance, research on adopting e-commerce platforms and digital tools among micro-retailers and food vendors is insufficient to fully understand the sector-specific barriers and opportunities they face (Koh et al., 2021; Norhayati et al., 2022). Furthermore, most research has focused on urban areas, where digital infrastructure tends to be more accessible. This creates a gap in understanding the unique challenges encountered by micro-enterprises in rural or remote regions, including poor internet connectivity, limited technical support, and lower levels of digital literacy (Nguyen et al., 2020). Addressing these disparities is essential for developing inclusive digital transformation policies.

Research on the behavioural and cultural factors influencing digital adoption remains limited. For instance, the impact of owner-managers attitudes, risk perceptions, and resistance to change in rural contexts is still underexplored. Existing studies often emphasize technological and financial aspects, while neglecting these softer barriers (Zhang & Lee, 2019). Although small and medium enterprises (SMEs) are frequently examined, micro-enterprises are commonly grouped with SMEs, which overlooks their distinct characteristics and unique challenges, such as minimal capital, limited human resources, and dependence on informal networks. This calls for the development of tailored strategies for digital adoption (Tong et al., 2020). Additionally, the impact of digital transformation on business outcomes is an area that has not received sufficient attention from researchers. While barriers to adoption are widely discussed, empirical evidence linking digital adoption to specific business outcomes, such as revenue growth, customer retention, or process efficiency in micro-enterprises is scarce. Further research in this area could yield valuable insights into the return on investment for digital tools (Hanafi, 2022). By addressing these gaps, future studies can offer targeted solutions and inform policies to support digital transformation within micro-enterprises across Malaysia.

3. Methodology

This study adopts a secondary data mixed-methods approach to comprehensively examine the adoption of digital tools among micro-enterprises in Northern Malaysia. The design combines both quantitative and qualitative methods to provide a more nuanced understanding of challenges, benefits, and readiness for digital transformation. Secondary data in mixed methods research is the process of identifying, evaluating, and incorporating one or more secondary qualitative or quantitative data sources into a mixed methods project (Watkins, 2022).

3.1 Data Collection

This study employs a dual methodological approach to explore digital tool adoption among micro-enterprises in Northern Malaysia. The primary quantitative method involves the distribution of a structured questionnaire to micro-enterprise owners. This instrument is designed to gather data on various aspects, including the utilization of digital tools, perceived challenges (such as costs and technical complexities), and recognized benefits (notably enhanced operational efficiency and expanded market reach).

Subsequently, semi-structured interviews will be conducted with micro-enterprise owners, relevant stakeholders, and policymakers to derive qualitative insights. These interviews will delve into participants' personal experiences with digital tools, their perceptions of governmental support, and the sector-specific challenges they encounter.

The target population comprises micro-enterprises located in Northern Malaysia, selected through a convenience sampling technique. While this method facilitates access to participants, especially within geographically concentrated areas, however, it may impose limitations on the generalizability of the findings. Survey data will be analyzed utilizing the most recent version of SPSS, applying statistical methods such as descriptive analysis, correlation, and regression to discern patterns and relationships inherent in the data. For qualitative data analysis, thematic analysis will be employed to identify recurring themes and patterns related to the barriers and enablers of digital adoption. This methodological framework ensures a comprehensive analysis, integrating quantitative data with in-depth qualitative narratives, thereby capturing both the breadth and depth of the challenges faced by micro-enterprises in adopting digital solutions.

4. Findings and Discussion

In the context of this study, we conducted a comprehensive literature review to synthesize existing research pertinent to the topic at hand. This involved systematically gathering and critically analyzing data from a wide array of scholarly sources. The analysis aimed to uncover insights and patterns that have emerged over time, thereby contributing to a nuanced understanding of the subject matter.

Through this rigorous process, we were able to distil relevant information that not only reflects the current state of knowledge but also identifies gaps in the existing literature. This synthesis of findings lays a solid foundation for our research, allowing us to engage with and build upon the work of previous scholars. By integrating these insights, we aim to further advance the discourse surrounding this research topic, ultimately enriching the academic conversation and informing future investigations.

4.1 Present Data

The digital landscape in Malaysia has seen significant transformation, yet micro-enterprises appear to be lagging in their adoption of digital technologies. According to a study conducted by Koh et al. (2021), only 40% of micro-enterprises are making active use of digital tools. This statistic highlights a crucial insight into the challenges faced by small businesses in embracing digitalization.

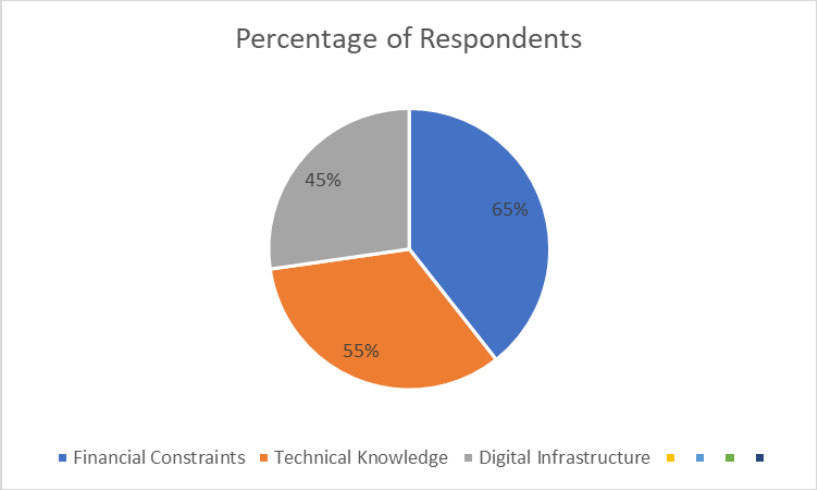
Several factors might contribute to this low adoption rate. Many micro-enterprises may lack the financial resources to invest in technology, which can be particularly daunting for businesses operating on tight margins. Additionally, there may be a skills gap where owners and employees are not adequately trained to utilize these digital tools effectively. Resistance to change is another significant barrier, as some business owners may prefer traditional methods they are familiar with and might be sceptical about the benefits of digital solutions.
The limited utilization of point-of-sale (POS) systems and e-commerce platforms presents a significant barrier to the growth potential of micro-enterprises. These businesses often play a critical role in local economies, yet their ability to compete effectively in an increasingly digital landscape is hampered by a reluctance or inability to adopt modern technological solutions. The integration of such technologies is essential for realizing increased operational efficiency, enhancing customer experiences, and expanding market reach. Research has shown that as the digital economy continues to evolve and expand, the imperative for micro-enterprises to leverage these tools becomes ever more pronounced to remain competitive in their respective markets.

However, the adoption of digital technologies among Malaysian micro-enterprises is notably low, highlighting a pressing need for more robust support systems designed to facilitate this transition. Training programs aimed at enhancing digital literacy and technical skills can potentially alleviate some of the barriers to adoption. According to a study by Nguyen and Le (2020), financial constraints rank as a significant barrier, cited by 65% of respondents. This suggests that without targeted financial assistance or subsidized access to technology, many micro-enterprises may struggle to invest in the resources necessary for digital transformation. Additionally, 55% of the respondents indicated a lack of technical skills as another critical obstacle, underscoring the necessity for comprehensive training initiatives that can equip business owners and their staff with the requisite capabilities to utilize these technologies effectively.

Furthermore, there are notable sectoral variations in the adoption rates of digital technologies among micro-enterprises. For instance, micro-enterprises operating in the food services industry exhibit higher adoption rates (47%) compared to those in the agriculture sector (30%). This discrepancy can be attributed to the inherently different nature of customer engagement in these industries. Food services often involve direct consumer interaction, necessitating the implementation of efficient transaction processes and enhanced customer service capabilities, which in many cases can be facilitated through the adoption of POS systems and e-commerce platforms. In contrast, agricultural micro-enterprises may not experience the same immediate customer engagement requirements, leading to a slower rate of technological adoption (Hanafi, 2022).

The low adoption rates of POS and e-commerce technologies among Malaysian micro-enterprises reveal a critical gap in their operational capabilities. Addressing this gap requires a multi-faceted approach that includes tailored support systems, financial incentives, and skills training. By enhancing the digital readiness of these micro-enterprises, policymakers and stakeholders can help facilitate their transformation into competitive players within the broader digital economy, ultimately benefiting local economies and communities as a whole.

Figure 1: Summary of Key Challenges in Digital Adoption



4.1.1 Digital Literacy Programs

Organize workshops and training programs aimed at enhancing digital skills, particularly in rural and underserved communities. Collaborate with educational institutions and NGOs to deliver these programs in local languages, ensuring greater accessibility (Zhang & Lee, 2019). Develop online courses and tutorials that are either free or subsidized to reach a broader audience.

4.2 Link to Literature

The findings align with the Technology Acceptance Model (TAM), which emphasizes perceived ease of use and perceived usefulness as critical determinants of adoption (Venkatesh & Davis, 2000). This study corroborates previous research showing that financial and technical barriers are significant inhibitors, as highlighted by Zhang & Lee (2019). However, this research diverges by identifying sector-specific nuances, adding granularity to existing literature.The implications outlined for business owners, policymakers, and educators regarding digital literacy and access to technology underscore the urgency of addressing the digital divide in today's economy.

4.2.1 For Business Owners

The findings indicate that many business owners may possess limited digital skills, which can hinder their ability to compete in an increasingly digital marketplace. To combat this, targeted training programs should be developed to address various skill levels and learning preferences. These programs could include workshops on digital marketing, e-commerce platforms, social media management, and basic IT skills. By enhancing digital literacy, business owners can leverage technology to increase their operational efficiency and reach a broader customer base.

Additionally, financial constraints often prevent small businesses from adopting necessary technologies. Therefore, government grants and subsidies for technology adoption could be invaluable. Such incentives would not only reduce the financial burden but also encourage business owners to embrace innovative tools and practices that can lead to growth and resilience in their enterprises.

4.2.2 For Policymakers

Policymakers play a crucial role in shaping the digital landscape. Their investment in improving digital infrastructure, especially in rural areas, is vital for ensuring that all communities have equitable access to technology. This includes expanding internet access to underserved regions, which can have a transformative effect on local economies. Initiatives such as subsidized internet and equipment can significantly lower barriers to entry for small businesses and entrepreneurs seeking to establish an online presence.

Moreover, by fostering a strong digital infrastructure, policymakers can stimulate economic growth, attract new businesses, and create job opportunities. They must prioritize collaboration with private sector stakeholders to develop innovative solutions that cater to the specific needs of local populations.

4.2.3 For Educators

The role of educators is paramount in preparing the next generation of entrepreneurs for a digital-first economy. Educational institutions should seize the opportunity to integrate digital skill development into their curricula, especially within entrepreneurial and vocational training programs. This could involve hands-on training in digital tools, case studies on successful digital businesses, and mentorship programs that connect students with industry professionals.

Additionally, educators should emphasize the importance of problem-solving and critical thinking in digital contexts. By equipping students with these essential skills, they can foster a mindset that thrives in adaptability and innovation—qualities crucial for success in the dynamic landscape of modern business.

Addressing the issues surrounding digital literacy and accessibility requires a collaborative approach involving business owners, policymakers, and educators. Each group has a distinct yet interconnected role in fostering an environment conducive to technological adoption and digital proficiency. By implementing targeted training, investing in infrastructure, and rethinking educational strategies, we can work towards a more inclusive digital economy that empowers all individuals and communities.

Table 1 below, presented above encapsulates a comprehensive overview of pivotal statistics concerning the landscape of digital adoption among micro-enterprises in Malaysia. This data not only illuminates the current state of digital integration within this segment of the economy but also underscores the various challenges these enterprises face in embracing technological innovations. The statistics highlight key areas where micro-enterprises are struggling, such as

limited access to resources, inadequate digital literacy, and the lack of tailored governmental support. These obstacles can significantly hinder their capacity to leverage digital tools effectively, thereby stunting potential growth and competitiveness in an increasingly digital marketplace.

Table 1: Digital Adoption Statistics Among Micro-Enterprises in Malaysia

Aspect	Statistic	Remarks
Social Media Usage	60% of micro-enterprises utilize social media platforms for business operations	Reflects the popularity of digital marketing and customer engagement on platforms like Facebook.
Use of Cloud Solutions	90% of micro-enterprises do not use cloud solutions	Highlights the low adoption of scalable and cost-effective IT infrastructure.
Business Organization	62% do not collect business data	Indicates missed opportunities for data-driven decision-making and operational efficiency.
Regional Digital Maturity	Higher digital adoption rates in Central Region vs. East Coast Peninsular Malaysia	Demonstrates geography in digital readiness and resource accessibility.
Digital Training Programs	Only 9% Micro Enterprises have implemented company-wide digital training programs	Shows the need for structured programs to build digital capabilities among employees.
Cybersecurity Measures	Many lack robust cybersecurity frameworks	Exposes vulnerabilities and risks associated with digital adoption.

Source: Boston Consulting Group (BCG) & Malaysia Digital Economy Corporation (MDEC). (n.d.). *Harnessing the power of technology to drive growth in Malaysia's digital economy*. Retrieved from https://web-assets.bcg.com

Moreover, the insights gleaned from this table raise important considerations for policymakers. Understanding the specific needs and barriers of micro-enterprises can guide the development of targeted intervention strategies aimed at facilitating digital adoption. Such strategies may include enhancing access to training programs, providing financial incentives for technology investments, and fostering collaborations between government and private sectors to create a more conducive environment for digital entrepreneurship. The data presented in Table 1 serves as a crucial foundation for analyzing the state of digital adoption among Malaysian micro-enterprises, revealing both the challenges they encounter and the opportunities for policy interventions that could enhance their operational capabilities in the digital age.

5. Recommendations

In light of the findings from the aforementioned study, it is imperative to develop and implement targeted strategies that address the challenges encountered by micro-enterprises in the adoption of digital tools. Such initiatives are essential for facilitating their digital transformation journey. The following strategies are proposed:

5.1 Strategies for Overcoming Barriers

This study has identified several strategies that are deemed worthy of consideration by researchers in the social sciences. These strategies may offer significant insights and could enhance the methodological approaches utilized in future research endeavours.

5.1.1 Government Incentives

Implement grants or low-interest loans specifically aimed at facilitating the purchase of digital tools and services. Initiatives like Malaysia's Prihatin SME Economic Stimulus Package (PENJANA) have proven advantageous, but they should be further customized to better

support micro-enterprises (Nguyen & Le, 2020). Additionally, offering tax incentives for the adoption of technology could promote greater investment in digital transformation.

5.2 Tailored Digital Tools Based on Business Size or Industry

To effectively support the growth of micro-enterprises, it is essential to develop and promote affordable, user-friendly digital tools tailored to their unique operational needs. For example, custom point-of-sale systems specifically designed for small retailers, alongside basic inventory management applications that cater to the requirements of food vendors and small-scale manufacturers, can significantly enhance their operational efficiency. Furthermore, establishing collaborative partnerships with private technology firms will facilitate the development of industry-specific solutions that prioritize both affordability and scalability, thereby ensuring that micro-enterprises can access the technology necessary for sustainable growth (Koh et al., 2021).

5.3 Encouraging Adoption of New Technologies

The investigation has yielded several findings that serve as pertinent recommendations for micro-entrepreneurs, researchers, and policymakers. These insights aim to facilitate the effective integration of innovative technologies within the micro-entrepreneurial sector, thereby promoting sustainable growth and competitiveness.

5.3.1 Demonstrating Value

Highlighting the success narratives and case studies of micro-enterprises that have effectively utilized digital tools can serve as a powerful mechanism for demonstrating the positive impact of technology in small business contexts. Additionally, implementing pilot projects can provide empirical evidence of the tangible benefits associated with these digital interventions, such as improved sales performance and operational efficiency, thereby fostering broader adoption within local communities.

5.3.2 Building Trust and Support

Establish community digital hubs or resource centres that offer technical support and mentorship for micro-enterprises. Additionally, implement a 24/7 online or telephone support system to assist in resolving technical issues related to digital tools.

5.3.3 Fostering a Digital Ecosystem

Promoting collaborative partnerships among micro-enterprises, larger corporations, and governmental entities is essential for the establishment of a robust digital ecosystem. It is imperative to advocate for the adoption of digital payment systems by implementing incentives for both businesses and consumers, thereby facilitating the integration of micro-enterprises into the broader digital economy.

By implementing these strategies, micro-enterprises can overcome barriers to digital transformation and unlock their potential for growth and innovation. These efforts would not only empower individual businesses but also contribute to the broader economic development of Malaysia.

6. Conclusion and Suggestions

In light of the findings from the aforementioned study, it is imperative to develop and

This study explored the barriers, benefits, and readiness of micro-enterprises in Malaysia for digital transformation. Key findings revealed that financial constraints, technical knowledge gaps, and limited infrastructure are significant barriers to digital adoption. However, digital tools offer immense potential for improving operational efficiency, customer reach, and innovation, with varying adoption rates across sectors. The findings highlight the importance

of targeted policies, digital literacy programs, and sector-specific solutions to support micro-enterprises in leveraging technology.

6.1 Limitations

The study's limitations include the use of convenience sampling, which may restrict the generalizability of results. Additionally, the focus on micro-enterprises in Northern Malaysia excludes insights from other regions, potentially missing broader trends or regional variations. The reliance on self-reported data may also introduce bias in the responses regarding digital tool usage and perceptions.

6.2 Suggestions for Future Research

Future research endeavours could focus on several critical areas to enhance our understanding of micro-enterprises and their operations:

6.2.1 Role of Emerging Technologies

It is imperative to investigate the transformative potential of advanced technologies, such as artificial intelligence (AI) and blockchain, in optimizing micro-enterprise functions, particularly in the domains of inventory management, marketing strategies, and supply chain dynamics.

6.2.2 Sectoral Deep Dives

Conducting sector-specific investigations is essential for elucidating the unique challenges and opportunities that exist within particular industries, such as agriculture and traditional handicrafts, thereby contributing to a more nuanced understanding of these sectors.

By focusing on the key areas identified, future research can significantly enhance our comprehension of the dynamics that enable micro-enterprises to flourish in the rapidly evolving digital economy. This exploration is particularly pertinent in the context of Malaysia, where many small businesses play a crucial role in fostering economic resilience and inclusivity. Understanding how micro-enterprises can leverage digital tools and platforms will provide valuable insights into their operational efficiency, market reach, and customer engagement strategies. These insights could lead to the development of tailored support systems, policies, and resources that empower micro-entrepreneurs to navigate the challenges posed by digital transformation effectively.

Moreover, examining the intersection of technology adoption and business sustainability will help to identify best practices that contribute to the long-term viability of these enterprises. This research could also explore the roles of innovation, collaboration, and community support in enhancing the capabilities of micro-enterprises. Ultimately, by illuminating these aspects, future studies can contribute to a more inclusive economic growth narrative, ensuring that the benefits of a digital economy reach all layers of society. This will not only benefit micro-enterprises in Malaysia but can also be a model for similar economies worldwide, promoting equitable development and greater social cohesion.

References

1. A.G Hanafi & H.H Ahmad (2021), The Effects Of Islamic Business Ethics On Family Business In Malaysia. *International Journal of Management, Information Technology and Accounting* (IJMIA), Volume 1, Issue 1.
2. De Soto, H. (1989). *The other path* (p. 17133). New York: Harper & Row.
3. Dumas, C. (2001). Micro enterprise training for low-income women: The case of the community entrepreneurs programme. *the Journal of Entrepreneurship*, *10*(1), 17-42.

4. Francis, F., Zirra, C. T. O., & Mambula, C. J. (2020). Reward system as a strategy to enhance employees performance in an organization. *Archives of Business Review–Vol*, *8*(6).
5. Goldmark, L. (2001). Microenterprise development in Latin America:: Towards a new flexibility. *The Journal of Socio-Economics*, *30*(2), 145-149.
6. Hanafi, A. G. (2022). The Development of Emotional Intelligence (Ei) Conceptual Model For Construction Project Management [Doctoral dissertation]. Universiti Utara Malaysia (UUM).
7. Hanafi, A. G., & Mohd Nawi, M. N. (2019). Can Project Managers' emotional intelligence contribute to the success of construction projects?. *TEST Engineering & Management*, *81*, 839-849.
8. Hanafi, A. G., Ahmad, H. H., Mansor, M. F., & Mustafa, W. A. (2023). An Integrated Approach in Empowering Technical and Vocational Education and Training (TVET) for Malaysian Asnaf in the IR4. 0 Era. *Journal of Advanced Research in Applied Sciences and Engineering Technology*, *30*(2), 255-271.
9. Kirkpatrick, C., & Hulme, D. (2001). Impact assessment: an overview. *available at: www. enterprise-impact. org. uk/pdf/CoreText. pdf (accessed 7 September 2009)*.
10. Koh, P. C., Lee, K. C., & Tan, C. C. (2021**).** Adoption of digital tools in micro-enterprises in Malaysia: A review of barriers and enablers**.** *Journal of Business and Technology*, 15(2), 112-130.
11. Manan, S. S. A., Johan, K., & Turan, F. M. (2023). Sustainability Performance Level of Small Medium Enterprises in Pahang in the Context of Non-renewable Energy Consumption Using Correlation Analysis. *Mekatronika: Journal of Intelligent Manufacturing and Mechatronics*, *5*(1), 57-61.
12. Ministry of Communications and Multimedia Malaysia. (2020). Malaysia Digital Economy Blueprint (MyDIGITAL). Retrieved from **https://www.mcmc.gov.my.**
13. Ministry of Finance, Malaysia. (2020). Economic Outlook 2020. Ministry of Finance, Malaysia.
14. Nguyen, T. M., & Le, V. T. (2020). *Regional challenges in digital adoption: A case of rural micro-enterprises in Southeast Asia. Journal of Regional Development Studies*, 8(3), 45-56.
15. Nor, N., Hanafi, A. G., & Saidatul, N. (2023). *Does Government Support Enhance the Sustainable Competitive Performance Among SMEs? Empirical Study Among Small Medium Enterprises(SMEs) Perlis. Volume 5, 1–11*.
16. Sardar, Z. (2020). The smog of ignorance: Knowledge and wisdom in postnormal times. *Futures*, *120*, 102554.
17. Storey, D. J. (2016). *Understanding the small business sector*. Routledge.
18. Subri, N. I., Hanafi, A. G., & Pozin, M. A. A. (2024). Comparative Analysis of eKYC and 2FA in Implementing PADU Database System to Strengthen Digital Identity Security.
19. Tinker, I. (2000). Alleviating poverty: Investing in women's work. *Journal of the American planning association*, *66*(3), 229-242.
20. Tong, S., & Goh, M. (2020). *Digital adoption in SMEs during the pandemic. Asian Journal of Business Research*, 19(1), 89-102.
21. Venkatesh, V., & Davis, F. D. (2000). A Theoretical Extension Of The Technology Acceptance Model: Four Longitudinal Field Studies. *Management Science*, 46(2), 186-204.
22. Watkins, D. C. (2022). *Secondary data in mixed methods research* (Vol. 8). SAGE Publications, Inc.
23. Yuen, T. M., & Baskaran, S. (2024). Optimizing Sustainable Business Performance: The Role of SME Agility in Digitalization. *International Journal of Academic Research in Business and Social Sciences*, *14*(1).
24. Yusuf, F. A. (2020). Sustainability innovativeness agility as an intervening variable in the managerial competence to business performance relationship of a family-owned company. *International Journal of Innovation, Creativity and Change*, *13*(9).
25. Zhang, X., & Lee, M. (2019). Cultural and financial barriers to digital adoption in SMEs: The case of Malaysian micro-enterprises**.** *Journal of Small Business Management*, 57(4), 1445-1460.
26. Zhu, K., Kraemer, K. L., & Xu, S. (2017). The role of information technology in business transformation: An empirical study of small businesses in Malaysia**.** *Information Systems Research*, 28(2), 391-410.