Rebuilding Microenterprises' Brand Identity through Technology Adaptation: A Case Study of Penang

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Abstract

Purpose: Microenterprises play a pivotal role in driving economic growth, innovation, and employment across both developed and developing economies. However, their ability to adopt and integrate emerging technologies remains a critical challenge and opportunity. This study explores and analyze the perceptions of microenterprise owners regarding the adaptation and integration of technology into their business operations. It aims to identify key themes that influence their attitudes toward technology, including perceived benefits, usage compatibility, and future needs, with the goal of informing policy and support strategies for digital transformation in the microenterprise sector. **Design/methodology/approach:** This research adopts K-J Methods when conducting the focus group study to gather data from microenterprise respondents though interviews and surveys. The study emphasizes self-reported perceptions and experiences, allowing for a nuanced understanding of how technology is viewed and utilized in small-scale business environments. The data collected from 20 respondents, both in mainland and Penang island were interviewed to explore the adaptations and understanding level in the technology applications and acceptance in their business at current. **Findings:** Responses were categorized into three major themes: Benefits of Technology Adaptation, Usage of Technology, and Future Technology Needs. The findings reveal overwhelmingly positive perceptions of technology among microenterprise respondents. They associate technology with improved business quality, customer handling, operational ease, and strategic control. Respondents also find technology compatible with their current practices and view it as a tool for innovation, diversification, and rapid communication. **Research limitations/implications:** The geographic scope may restrict generalizability, and the absence of negative perceptions may overlook critical barriers such as cost, infrastructure, or digital literacy. Future research should address these limitations by incorporating broader samples, objective performance metrics, and deeper exploration of challenges. **Practical implications:** The insights from this study can guide policymakers, NGOs, and technology developers in designing targeted interventions for microenterprises. Support programs should focus on providing accessible, user-friendly tools that align with local business practices. Training initiatives should emphasize practical skills and peer learning, while digital platforms should be designed with flexibility and ease of use in mind. Enhancing observability and showcasing success stories can

further encourage adoption. These insights contribute to a deeper understanding of how microenterprises can navigate the digital landscape and sustain growth in an increasingly tech-driven economy. **Originality/value:** This study contributes original insights into the lived experiences and perceptions of microenterprise owners regarding technology adaptation. It highlights the nuanced ways in which small business operators engage with digital tools not just as functional assets, but as enablers of growth, community, and innovation. By focusing on microenterprises, which are often underrepresented in technology adoption research, the study adds valuable depth to the discourse on inclusive digital transformation

Keywords: Microenterprises, Technology Adaptions, K-J Methods

Introduction

Microenterprises form the backbone of Malaysia's entrepreneurial landscape, and their presence in Penang is both vibrant and vital. Defined by SME Corporation Malaysia, microenterprises are businesses with fewer than five full-time employees and annual sales turnover below RM 300,000, microenterprises represent the smallest tier within the broader category of Small and Medium Enterprises (SMEs). Despite their modest scale, these enterprises contribute significantly to local economies, particularly in urban centers like George Town and Bukit Mertajam, where informal and semi-formal businesses thrive. In Penang, the state aligns itself with the national agenda while concurrently nurturing creative industries. Initiatives like the 'Entrepreneurship One Culture' (K1B) campaign and the Go Digital Micro Entrepreneur Programme in 2021 have not only empowered traditional businesses but also provided a platform for creative entrepreneurs to thrive (Bulletin Mutiara, 2023).

According to the Department of Statistics Malaysia (DOSM), microenterprises accounted for approximately 76.6% of all SMEs nationwide in 2024, translating to over 830,000 firms across the country. While Penang specific figures are recorded as 84,007 ranking 4th place in the number of MSME Establishments by State, 2024 (Department of Statistics Malaysia (DOSM). The state mirrors national trends, with microenterprises dominating sectors such as food and beverage, retail, logistics, and tourism. These businesses are often family-run, home-based, or operate in traditional settings like hawker stalls and small shops, reflecting Penang's rich cultural and commercial heritage.

Microenterprises are proven to be one of the vital proliferates in contributing to Malaysia's continuous economic growth particularly with the government's focus on supporting them and the rise of digital and e-commerce opportunities. With the right policies, proven access to financing, and continuous encouragement to develop entrepreneurial skills, microenterprises will continue to play an essential role in job creation, economic diversification, and community development in Malaysia. Micro, small, and medium enterprises (MSMEs) are the pillars for the employment creation, innovation, and wealth creation of a country. In Malaysia, MSMEs accounted for around 1.2 million or 97.4 percent of the total business establishments which contributed 38.4 percent of gross domestic product (GDP), 10.5 percent of total exports, and 48.2 percent of total employment (National Entrepreneur and SME Development Council, 2024). Despite significant MSMEs' contribution to the national economy, it is now becoming the nation's backbone in income contribution.

Penang authorities, over the years much keen in promoting SMEs to enhance economic growth. The Penang Structure Plan 2020, Penang Structure Plan 2030 and The Northern Corridor Economic Region Strategic (NCER) Development Plan formulated specific strategies for the development of SMEs. A more concerted effort by the relevant agencies is needed to help Penang microenterprises achieve better access to opportunities and develop their products and services to be more competitive. For this reason, it is crucial to identify the deliberate strategies SMEs should implement as commercial enterprises to realise their true potential and operate in tandem with government policies.

Although SMEs and microenterprises are critical to Malaysia's economy, contributing factors to their success produce considerable scholarly dispute Scholars from various fields researched on the critical natures of microenterprises and small medium entrepreneurs in innovations and performance (Sharif, 2023), entrepreneurial development among women microentrepreneurs in Malaysia (Tirumalaisamy, 2024), and growth challenges of SMEs in Sabah (Ambad, 2020) while only a few explored the technology adaptions among the microentrepreneurs in Malaysia. Therefore, this study aims to fill the research gap by exploring brand identity through technology adaptation among microenterprise, mainly in focus of Penang microentrepreneurs.

The general objective of the study is to explore and examine the current level of technology adoption among microenterprises in Penang. Along with it, to identify the key drivers and barriers influencing technology adoption and to assess the impact of technology adoption on business performance and sustainability among the microenterprises in Penang. The study answered few research questions, the main challenges faced by microenterprises in adopting new technologies, the affect of the technology adaptations in microenterprises, and what are the implementations to improve digital readiness and adoption among microenterprises in Penang.

In order to support and motivates the microenterprises to move forward along with the current issues and expectations, Malaysia Digital Economy Corporation (MDEC), under the Ministry of Digital, has launched an initiative to accelerate the digital transformation of small and medium enterprises (SMEs) nationwide in Penang. The initiative aims to empower SMEs with tools, knowledge, and support to embrace digitalisation and thrive in the digital economy. By adopting digital tools and innovative solutions, microenterprises can improve efficiency, expand their reach, and strengthen their resilience in the global market while achieving greater productivity and operational efficiencies. This issue motivates this research to identify the adaptations of technology among the microenterprises in Penang and through content analysis, able to discusses additional ways for microenterprises to make progress in tandem with these technology development initiatives.

Literature Review
Re-establishing brand identity for microenterprises necessitates a strategic alignment of resource limitations, customer experience, and digital narratives across various touchpoints (Abd Shukor, R., et al. (2023). The diffusion of technology influences this realignment by altering how microenterprises formulate, convey, and authenticate brand meaning (Shi & Shen, 2025). A focused analysis of diffusion elements (relative advantage, compatibility,

complexity, trialability, observability) clarifies why certain branding technologies succeed in scaling among microenterprises while others do not (Florea, 2015).

A comparative examination of technology types reveals varying returns for brand revitalization. Visual and social media platforms (Instagram, TikTok) provide high immediacy and discovery potential for craft and food microenterprises, leading to swift improvements in perceived authenticity and repeat purchases when combined with robust visual practices (Zhang & Lin, 2024).

Conversely, service-oriented and appointment-based microenterprises garner more substantial brand benefits from booking systems, reputation management, and simplified CRM tools that minimize friction and enhance perceived reliability (Zhang & Lin, 2024). From an analytical perspective, platform capabilities align with brand outcomes: reach and narrative (visual platforms) versus trust and operational reliability (transactional systems) (Kapferer, 2012; Keller, 2013).

Regional and context-specific comparisons indicate differing diffusion paths. In developing nations, inconsistent infrastructure, cultural trust networks, and regulatory obstacles influence both the speed of adoption and branding outcomes, making bundled interventions (training + subsidies + peer networks) more effective than technology provisioning alone (OECD, 2020; Sultan, 2011; Gomez, 2023).

Conversely, microenterprises in digitally advanced markets achieve quicker brand returns through data-driven personalization and AI-assisted content, although these gains depend on analytical proficiency and platform specialization (Deryl et al., 2023; Nguyen, 2023). Comparative assessments of intervention strategies highlight notable performance variations. Capacity-building and peer-learning frameworks yield higher sustained brand consistency and user engagement than one-off grants or infrastructure initiatives (Jaish, et al., 2023; Loo et al., 2023). Policy-level ecosystem mechanisms (interoperable payments, platform standards, digital public goods) reduce systemic barriers and create shared credibility cues that emerging brands can utilize; where these ecosystem supports are weak, microenterprises rely more on local networks and offline reputations, which constrains digital branding success (Porter, 2001; Gomez, 2023).

An analytical synthesis of capability dynamics indicates two essential but insufficient prerequisites for brand revitalization: access to technology and established content production processes. Access without regularity leads to erratic visibility and weak identity signals, while regularity without suitable platform alignment wastes resources on ineffective channels (MacGregor & Vrazalic, 2005; Kaynak et al., 2005). Evidence from different sectors supports this: craft microenterprises that utilize straightforward content calendars and affordable analytics achieve sustained engagement, whereas those that post sporadically on various platforms experience limited gains in brand equity (Michaelidou et al., 2011; Zhang & Lin, 2024).

Emerging technologies alter the comparative advantage landscape. AI-enabled creative tools and automation lower production costs and allow small businesses to scale personalized storytelling, but they also generate differentiation challenges as more firms access the same

creative tools; brand uniqueness increasingly relies on narrative authenticity and community co-creation rather than just production quality (Deryl et al., 2023; Shi & Shen, 2025). Early comparative evidence indicates that platform interoperability and partnerships for open innovation enhance these effects for microenterprises that lack internal technical resources (Carvalho et al., 2021; Zhang & Gomez, 2025).

Research gaps persist, particularly in longitudinal comparative studies that trace brand equity trajectories across different technologies, sectors, and ecosystem contexts. Future research should implement mixed methods and quasi-experimental designs to assess blended interventions, quantify sustained brand equity improvements, and identify the mediating influence of regular content practices and ecosystem support (Shi & Shen, 2025; Loo et al., 2023; Deryl et al., 2023).

Methods
The purpose of this study was to explore the adaptations and the usage level technology among the microenterprise players in Penang. hence this study was exploratory in nature. The identifications of the adaptations and usage level was based on the knowledge sharing and perceptions pf the participating entrepreneurs in microenterprises. The K-J Methods was used when conducting the focus group study.

A focus group study was formed for the data collections to explore the adaptations and the usage level technology among the microenterprise players in Penang. The participants for the focus group were a combination of different microentrepreneurs or microenterprises owners from different industry and districts both in the Penang island and mainland. A total of 5 sessions were conducted, where in each session combination of 4 participants were interviewed, and a total of 20 microenterprise owners / microentrepreneurs participated in the KJ Method session. In the 5 session, each participant was interviewed and partly were shared the link as the data collection though Google Form. The focus group was determined as to the five variables as (1) Location, (2) Business Nature, (3) Years of Operations, (4) Number of Staff , (5) Annual Income, (7) Age and (8) Business Types/Field. This method was meant to encourage participants to freely contribute their ideas that will be later discussed and decided upon to be considered as crucial and important ideas for the study as the outcome and solutions in future.

Participants were asked to consider and identify the technology adaptations applied in their business nature as their brand identifications that contribute to their success. Later, they were asked to explain these aspects of success factors to reach standard agreement. After that, the commonly agreed factors were grouped and concluded. The conclusions divided into a quadrant based on one indicators positive / important. The summary of the themes were concluded by inter-rater reliability whereby it is concern to choose one best description chosen to suite the fact that multiply respondents concern may experience.

This study is a qualitative research, which intended to explore the technology adaptations among the microenterprises whereby contribute to their business success. A number of open-ended questions were used to gauge the responses as how technology helps in their daily business, what are type of technologies used in their business and other technology driven support questions. The data collected from 20 respondents questioned to explore the

adaptations and understanding level in the technology applications and acceptance in their business at current. The respondents were questioned by individual to reach standard agreement. Those questioned factors were written in the questionnaire and some were received through Google Form distributions.

Findings

Criteria was established to guide the researchers during the selection process as to ensure those involved in the focus group able to represent the population. Criteria are (1) entrepreneurs located in urban or rural areas, (2) nature of business, (3) have been in the business for at least one year, (4) number of staff at least 5 to 10, (5) annual income at least RM10,000 as further illustrated in Table 1.

Variables	Description	Frequency	Percentage
Table 1 **Respondents Profile**			
Location	Rural	8	40.0
	Urban	12	60.0
Business Nature	Micro	16	80.0
	Non-Micro	4	20.0
Years in Operation	Above 10 years	9	45.0
	Less than 5 years	5	25.0
	Between 5 – 10 years	6	30.0
Number of Staff	More than 50	6	30.0
	Less than 10	10	50.0
	Between 10 - 50	4	20.0
Annual Income	RM20,000 and above	5	25.0
	Less than RM10,000	9	45.0
	RM10,000 – RM20,000	6	30.0
Age	31 – 40 years old	10	55.0
	41 – 50 years old	6	30.0
	51- 60 years old	4	20.0
Business Type / Field	Food Related (manufacturers, processing, packaging)	12	60.0
	Retail / Grocery	5	25.0
	Healthcare	1	5.0
	Education / Training	1	5.0
	Apparel Trades	1	5.0

The total number of respondents involved in the focus group is 20 conducted micro business in various fields as food business, retail/grocery, healthcare, education/training and apparel traders. These micro entrepreneurs came from various business types hence their inputs can be validated to represent the microenterprise.

In terms of location, 16 of the microenterprises were located in urban areas while 4 are located in rural areas of Penang. Those microenterprises located in rural areas are as Perkampungan Juru, Macang Bubuk, Permatang Damar Laut, Permatang Rawa, Permatang Pauh, Kampung Batu Maung, Kampung Jawa and Kampung Buah Pala. These rural places are mostly lack with several facilities as transport and mainly internet connections. The urban locations are more focused in Georgetown, Bukit Mertajam, Bukit Jambul, Persiaran Gurney, Alma, Butterworth, Air Itam, Farlin, Batu Ferringi, Balik Pulau, Mak Mandin, Seberang Jaya, Paya Terubung, Gelugor, Tanjung Bunga and Bukit Minyak whereby much microenterprises are visible in business.

In terms of age of respondents, 10 of them were between 31 to 40 years old. Four of them aged between 51 and 60 years old, followed by 6 of them aged between 41 to 50 years old. These are the golden ages of the microentrepreneurs as they have stabilized their business and most of them have expanded their businesses. But the majority microentrepreneurs are in the middle age group whereby most probably in business more than 5 years.

Most of the business owners corresponded in the study was microenterprises whereby as defined by National SME Development Council (NSDC) and SME Corporation Malaysia, a microenterprise is defined as a business with fewer than five employees or a sales turnover of less than RM 300,000. Around 80 percent respondents are small business owners while around 10 percent are no micro business nature as in big scale entrepreneurs.

From the annual income, 9 respondents reported as below or less than RM10,000 while 5 of them reported as RM20,000 and above. The annual turnover can be predicted as logic as most of the microenterprises are in operation for more than 5 years and with the manpower of between 10-50. High annual income mostly associated with high operating cost and monthly sales, as in this study the cost of operations depending on the type of business the respondents are into.

Participants were asked to consider and identify the factors that contribute to their success in brand identifications through technology adaptations. They were questioned on these aspects in groups or few of them individually based to reach standard agreement. Upon that, the commonly agreed factors were transferred to the white paper. The white paper was divided into three quadrants based on three indicators; benefits of technology adaptations, usage of technology adaptations and future technology needs. The participants discussed the factors and agreed on the placement of these factors on the white paper (Morgan et al., 2003).

The data collected from the focus group study were analysed using content analysis whereby the responses were compiled and categorised accruing to the themes. Three main conclusive themes arose from the analysis. The themes are benefits of technology adaptation, usage of technology adaptation, and future technology needs. These factors detailed in Table 2 as below.

Table 2 Summary of themes as perceived by microenterprise respondents in technology adaptation	
Positive / Important	
Benefits of Technology Adaptations	1. Using technology benefits my business 2. Using technology is more useful for handling customers. 3. Using technology improved the quality of my business 4. Using technology ease my business 5. Using technology provides me with great control over my business 6. Using technology enhances the effectiveness of my business
Usage of Technology Adaptations	1. Using technology is completely compatible with my current situation 2. Using technology fits well with how I deal in my business 3. I can explore more options in developing my business with technology 4. Able to reach and communicate fast with customers 5. Able to diversify and innovate with technology
Future Technology Needs	1. I believe I could communicate to others the outcomes of using technology in my business 2. Using technology in my business helps me to fit in with a group of people who share the same interests 3. Learning to operate technology would be easy for me 4. I would find it easy to get technology to do what I want it to. 5. I would find technology to be flexible to interact with

Benefits of Technology Adaptations
Microenterprise respondents strongly associate technology with tangible improvements in their business operations. They believe that technology directly benefits their business by streamlining processes, improving service delivery, and enhancing overall performance. For example, using digital tools helps manage customer relationships more effectively, which is critical for small businesses that rely on repeat clients and word-of-mouth referrals. As Mustafa and Yaakub (2018) explained, for a company to succeed in something new or unique and develop the company's performance, a firm should emphasize technology adoption. Technology is also seen as a means to ease business operations, reduce manual tasks, automate routine functions, and save time. The sense of control that technology provides is another key benefit, allowing owners to monitor and manage their businesses more precisely. Respondents also note that technology improves the quality of their products or services, suggesting that digital integration leads to better standards and consistency. Finally, respondents highlight that technology enhances effectiveness, enabling them to achieve goals more efficiently and respond to market demands with agility. Adding on, technology is considered as the primary key to drive living standards in the current modern world. Moreover, technology is an essential tool for quality products and expansion of businesses in both local and global market. Additionally, the study by Chairoel et al. (2015) explained that an organization's performance is beyond implementation and technology usage, meaning that an organization would meet more high quality standards with the use of technology. In

the current corporate world, technology is one of the most major elements which is hard to ignore in any business type and microenterprises should not to be left out.

Usage of Technology Adaptations
Respondents perceive technology as highly compatible with their current business practices. This compatibility is crucial because it reduces the friction often associated with adopting new systems. They feel that technology fits well with how they conduct business, indicating that digital tools align with their values, routines, and customer engagement strategies. Moreover, technology opens up new avenues for business development respondents' express optimism about exploring more options, such as expanding into e-commerce or adopting digital marketing. Fast communication with customers is another major advantage, as technology enables real-time interactions through platforms like WhatsApp, Facebook, or email. This immediacy strengthens customer relationships and improves responsiveness. Lastly, the ability to diversify and innovate through technology is seen as a strategic asset. Respondents recognize that digital tools allow them to introduce new products, services, or business models, helping them stay competitive in a rapidly evolving marketplace. Overall, the adoption of technology positively benefits a microenterprises in developing their business.

Future Technology Needs
Microenterprise owners also reflect on their future needs and aspirations regarding technology. They believe they can effectively communicate the outcomes of using technology, which is important for building trust with stakeholders and sharing success stories with peers. This confidence in articulating benefits suggests a growing digital literacy and awareness. Respondents also value the social aspect of technology—using it helps them connect with others who share similar interests, fostering a sense of community and belonging. This is particularly relevant in informal business networks where peer learning and support play a vital role. Learning to operate technology is not seen as a barrier; instead, respondents' express confidence in their ability to master new tools. They believe they can easily get technology to perform desired tasks, indicating a sense of empowerment and control. Flexibility in interaction is another key expectation respondent want technology that adapts to their needs, rather than rigid systems that require extensive customization. Technology is a tool that microenterprises should adopt to improve their performance and build strength to compete with competitors. Entrepreneurs of microenterprises need to understand the benefits or the advantages of technology to drive effective management. On the other hand, it might be a severe challenge for an organization to adopt technology due to barriers such as lack of skill or knowledge of technology, absence of technology awareness, but steps must be taken to adopt and work with the technology as forward thinking and future adaptations.

Discussion and Conclusion
The main purpose of this study is to examine the technology adoption among microenterprises in Penang. Based on the themes framed, the results are grouped into three major ones as benefits, usage and future needs. As part of the government's initiatives to move forward all the micro entrepreneurs to digital era, technology adoptions become much crucial to the players in all level of business. The focus group interviewed exposed their high level of technology acceptance in their business routine. Only a minority of them are in leaning process but majority of the micro entrepreneurs are performing well with the

technology adaptations in their business. Beyond that, a firm need to invest in the application of technology and observe the improvement by comparing before and after. Generally, investment in technology is always the advantage of any organization.

The most prominent factor that can be observed through the study is the technology adaptations and usage among the microentrepreneurs, which is pertinent in facilitating microentrepreneurial success to promote their brand identity. It is critical to examine the determinants of technology adoption by SMEs to pinpoint certain factors that could either promote or inhibit the use of technology (Othman et al, 2025). The microentrepreneurs unanimously agreed by adopting technology in their routine business benefits them in several ways. Digital platforms as accounting software, E-commerce platform and marketing tools as Canva and other promotional solutions have enabled them to expand their reach to the customers. Adding on, operational cost are significantly reduced and improved efficiency. The technology adaptations is not merely supportive in their business but indeed plays the crucial role as the driver of growth and sustainability in microentrepreneurial ventures.

The technology adaptations proven to improve the daily and routine business operations as mentioned by the group of microentrepreneurs interviewed. However scholarly studies have highlighted that SMEs in Malaysia are slow in adopting digital tools for their business process (Lada et al., 2023; Enshassi, M., et al. (2024). Through the study, it is reported that digital tools help microentrepreneurs in process speeding and errors reductions. At the same time, proves standardized process and consistency ensuring in their product and service delivery methods via the adaptions. Initially without the technology adaptations, this were hard to detect. The improvements in delivery and customer service enhances the reputations of business and increases trust among their new and existing customers and vital for the long-term success.

The research conducted with 20 microentrepreneurs clearly demonstrates that technology adaptations yield substantial benefits. From improving customer management and business quality to simplifying operations and strengthening control, technology plays a transformative role in entrepreneurial success. While the sample size is limited, the findings highlight a broader trend: in today's digital age, microentrepreneurs who embrace technology are better positioned to thrive, innovate, and sustain growth. Thus, technology is not merely a tool but a strategic asset that shapes the future of entrepreneurship.

Practical and Social Implications
The present study is meant to explore the technology adaptations level and success among the microenterprises in Penang based on focus group study approach. The findings discovered that three factors are important to investigate the level of technology adaptations among the microenterprises. The insights from this study can guide policymakers, NGOs, and technology developers in designing targeted interventions for microenterprises. Support programs should focus on providing accessible, user-friendly tools that align with local business practices. Training initiatives should emphasize practical skills and peer learning, while digital platforms should be designed with flexibility and ease of use in mind. Enhancing observability and showcasing success stories can further encourage adoption.

Limitations and Suggestions for Future Research

The study may have been limited to a specific region or a small number of microenterprise respondents, which restricts the generalizability of the findings. Microenterprises in urban areas may have different experiences and access to technology compared to those in rural or underserved regions. While the study emphasizes positive perceptions, it does not sufficiently explore negative or neutral views. This may overlook barriers such as cost, lack of infrastructure, cybersecurity concerns, or resistance to change factors that are critical in shaping adoption outcomes. Future studies should include a broader range of microenterprises across different regions and industries to capture diverse experiences. Comparing urban and rural adoption patterns or service-based and product-based businesses could yield valuable insights. Future research should delve into the challenges and constraints faced by microenterprises, including financial limitations, digital literacy gaps, and infrastructural issues. Understanding these barriers is essential for designing effective support programs.

Acknowledgement

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