THE DIGITAL TRANSFORMATION JOURNEY OF A SME IN MALAYSIA: A CASE STUDY ON TECHNOLOGY IN TA ENTERPRISE

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Abstract

This qualitative case study examines the digital transformation of TA Enterprise, a family-owned signage SME in Malaysia. Utilizing the Technology-Organization-Environment (TOE) framework, the research, based on interviews and field observations, investigates how technological, organizational, and environmental factors influence digital adoption. Findings indicate that despite existing technological awareness and aspiration, progress is hindered by organizational readiness, resource limits, and generational resistance. Customer demand and market trends necessitate digital adoption for competitiveness. While government grants exist, bureaucratic hurdles complicate their utilization. The study offers actionable insights, recommending phased adoption strategies and targeted government support to enhance Malaysian SME digital readiness.

Keywords: Digital Transformation, Malaysia, TOE Framework, Digital Adoption, Case Study.

Introduction

This research investigates the multifaceted factors driving digital transformation in family-owned Small and Medium-sized Enterprises (SMEs) in Penang, Malaysia. Using the Technology-Organization-Environment (TOE) framework, the study offers a holistic view of digital adoption, evaluating Technological, Organizational, and Environmental dimensions. TA Enterprise, a Penang-based signage and automotive accessories SME, serves as a key case study, representing the common multi-industry operations of Malaysian SMEs. This research assesses its potential for seamless digital integration. Addressing a gap in state-level studies, particularly for areas like Penang, this initiative is vital. Given that Selangor and Kuala Lumpur host the largest SME concentrations, findings from a Penang SME can benchmark for similar states, significantly contributing to Malaysia's broader digital transformation goals by identifying crucial readiness, challenges, and actions for SMEs.

Research Objective

The main research objective is to identify the multifaceted factors driving digital transformation within family-owned small and medium-sized enterprises (SMEs) in Malaysia.

Scope of the Research

Population Scope

This case study research focused on the digital transformation journey of a Penang-based family-owned SMEs in Malaysia, with 9 employees (Including owner) working currently in the organization.

Variable Scope

The Digital Transformation Journey of A SME In Malaysia: A Case Study on Technology in TA Enterprise

Time Scope

The research is being conduction between the year of 2024 to 2025, with interview and discussion being completed in year 2025.

Literature Review

Digital Transformation in the Malaysian Context

Despite Malaysia's two-decade digital transformation efforts, SME adoption remains uneven, particularly among micro-businesses, due to owners limited digital exposure (Tajudeen, Moghavvemi, Thirumoorthi, Phoong, & Bahri, 2025). Financial constraints, perceived high costs, and bureaucratic hurdles deter grant applications (Jaish, Murdipi, Razak, & Alwi, 2023). While infrastructure improves, regional inadequacies persist (Digital News Asia, 2025). The COVID-19 pandemic highlighted preparedness gaps (Tajudeen, Moghavvemi, Thirumoorthi, Phoong, & Bahri, 2025). Government programs show mixed effectiveness, often failing to significantly mediate positive SME performance due to underlying owner mindsets (Misron, et al., 2025) . This research provides grassroots insights into TA Enterprise's experience, addressing these gaps.

Digital Transformation in SMEs

Digital transformation is a holistic process for SMEs, offering efficiency, market reach, and innovation despite limited resources (Dörr, Fliege, Lehmann, Kanbach, & Kraus, 2023). Universal barriers include financial constraints, lack of technical expertise, and data security concerns (Gao, et al., 2023). Organizational culture and management dedication are equally critical hurdles. Most Malaysian research focuses on urban centers, leaving a void in understanding SMEs in states like Penang, which face unique challenges such as a "follower" mindset and perceived high costs (Lim & Baharudin, 2013). This study addresses this geographical and contextual gap.

Digital Transformation in Family Businesses

Family-based SMEs face distinct digital transformation challenges due to entrenched traditions and resistance to change, though many recognize its survival importance (Hassan, Kamaluddin, & S. Saad, 2021). Family dynamics and generational differences profoundly influence adoption, with younger generations navigating older authority (Mei Xuan & Yoke Mei, 2024). Lack of succession planning and incumbent reluctance can impede progress, while strong family networks may facilitate it (Mukhtar, 2021). With 70-88% of Malaysian SMEs being family-owned and often manual (KPMG, 2024), resistance and risk aversion are prevalent (Sukamdani, 2023). Research on intergenerational dynamics and cultural influences (e.g., Chinese entrepreneurial traditions) in these contexts remains scarce, a gap this study addresses via TA Enterprise.

TOE Framework and Malaysia SMEs' Digital Adoption

The Technology-Organization-Environment (TOE) framework explains technology adoption through three contexts: Technological (innovation characteristics), Organizational (firm resources, culture, family dynamics, "follower" mindset), and Environmental (market, government, infrastructure). Recent research integrates cultural variables, like Chinese traditions, into TOE to understand Malaysian SME priorities. This framework is uniquely suited for TA Enterprise, allowing investigation of its specific technological perceptions, organizational dynamics, and external environment, addressing research gaps in Penang's family-owned SMEs.

Research Methodology

This study applies a qualitative case study methodology as the research method, which provide an avenue for a comprehensive understanding of the digital transformation journey of an SME in Malaysia. This study will focus on a single company, allowing a detailed investigation of the digital transformation possibilities, challenges, and opportunities for an SME in Malaysia. Interview are being conducted follow by field note collected by the researcher.

Research Steps

The researcher approached TA Enterprise's owner, who agreed to the digital transformation study after reviewing the proposal. Interviews were then scheduled with willing participants. During this period, the researcher conducted interviews and collected field notes. All recorded data were manually reviewed and analyzed without software, with transcribed interviews documented in a Microsoft Word file.

Data Collection

This research employs a qualitative method, utilizing semi-structured interviews for data collection. The study's sample comprises nine employees of TA Enterprise, seven of whom are family members. This purposeful sampling approach allows for greater control over confounding factors (Indrayan & Mishra, 2021), as participants possess specific business knowledge crucial for achieving research objectives. To protect privacy and business interests, participant identities will remain undisclosed, with individuals identified solely by alphabetic designations. This ensures ethical data collection while maintaining the integrity and focus of the study.

Data Analysis

For this research, interview data from participants are analyzed, summarized, and used to generate findings, classified to highlight key results aligned with research objectives (Yin, 2018). Inductive thematic analysis is the primary method, beginning with initial thoughts to inform coding. The study employs in-method methodological triangulation, conducting interviews across all organizational levels, from the owner to external hires. This, combined with researcher-generated observation field notes, further augments the validity of the research data.

Research Results

The data collected have identified thirteen themes, which can be further categorized into three major themes focused on the technological, organizational, and environmental contexts.

Technology

Sub-theme	Frequency	Sample Quotes
Technology Awareness and Aspiration	23	"Imagine automating our license plate production with robotic arms or using AR to let clients visualize signage in real-time!" (Participant E)
Current Digital Practices	18	"We are using the traditional Pen-and-paper method to track our income and expenses." (Participant B)
Opportunities for Efficiency and Growth	21	"Digital tools could allow us to create more intricate designs, work faster, and offer more customization options to our clients." (Participant H)
Innovation in Design and Production	15	"I'm interested in computer-aided design (CAD) software that could help us create more complex designs." (Participant D)
Integration and Change Management	12	"We need to find a way to maintain the quality and craftsmanship we're known for while leveraging the benefits of digital tools." (Participant D)

TA Enterprise's owner and most employees, supported by a tech-savvy son, recognize technology's importance, influenced by their educational backgrounds. Currently, operations are largely manual, despite modern machinery running on older systems; digital presence is limited to a Facebook page, and marketing relies on word-of-mouth. This indicates significant potential for improved technological literacy and productivity.

The company's customization strength can be optimized with digital design software (Adobe Illustrator/Photoshop) and AI, reducing waste and fostering expansion. Digital technologies promise a 10-20% operational boost (Wang & Shao, 2024), saving time, money, and human resources, especially in finance and marketing. Integrating new tools with existing manual workflows is challenging due to compatibility, requiring careful selection, a phased pilot approach, and a clear roadmap for smooth adaptation.

Sub-theme	Frequency	Sample Quotes
Tradition	17	"We've built our reputation on quality craftsmanship and personal service, and I don't want to lose that." (Participant A)
Training	14	"We'd need to invest in training and make sure everyone is on board before we start adopting new technologies." (Participant A)
Resistance to Change	11	"Aiyah, don't talk to me about this digital nonsense lah! Waste of time only." (Participant I)
Financial/Resource Limits	19	"We're a small business, and every ringgit counts... These new technologies can be so expensive." (Participant B)
Generational and Workforce Dynamics	16	"I'm relying on my son to help us navigate it... He's the one who understands all this technology stuff." (Participant A)

Organization

TA Enterprise's reliance on manual craftsmanship and ingrained tradition, especially among veteran employees, fuels skepticism and resistance to digitalization. Older staff often prefer existing manual methods, perceiving new technologies as irrelevant or too challenging, leading to organizational inertia exacerbated by generational divides. This makes introducing new processes difficult, as workflow disruption is seen as jeopardizing stability. Effective training is crucial but costly, with potential productivity dips. Financial constraints, typical for SMEs, heavily influence technology investment, demanding solutions with clear efficiency

gains and low recurring costs. Training expenses further strain the budget. With a small team, digital adoption must be carefully sequenced to avoid overwhelming staff, requiring "right-sized" solutions.

Sub-theme	Frequency	Sample Quotes
Customer Expectations and Market Trends	13	"Clients now demand online quotes and 3D mockups." (Participant E)
External Factors	9	"Even our customers and suppliers are digitizing—if we don't sync with their ERP systems, we'll face delays." (Participant E)
Government Policy and Support	7	"The government has been supportive of digital transformation, especially for small businesses like ours. There are grants and programs available." (Participant A)

Environment

Customer expectations for TA Enterprise now favor digital mock-ups and convenient online payment methods. The signage market demands interactive solutions, with digital out-of-home (DOOH) advertising rapidly growing, compelling TA Enterprise to integrate new digital technologies to remain competitive (Dhesi, 2024). External factors, including competitive pressure from digitally advanced markets like China and the need for interoperability with external systems, necessitate modernization. Government incentives, such as the MADANI Digital Grant, significantly support SME digital transformation by alleviating financial burdens and providing essential resources like training and infrastructure enhancements, which the owner views as crucial for their digital roadmap.

Discussion

Technology Context

TA Enterprise's awareness and aspiration for digital solutions are crucial for strategic planning (Oliveira & Martins, 2011), with insights from international markets boosting aspirations (Rogers, 2003). The firm's reliance on legacy machinery and manual workflows places it in an early, hybrid phase of digital adoption, yielding initial benefits but exposing vulnerabilities like manual stock count risks (Brynjolfsson & Mcelheran, 2016) (Rogers, 2003). This necessitates sequential capability building. Innovation in design and production, focusing on rapid prototyping and customization, is vital for competitive offerings (Yoo, Henfridsson, & Lyytinen, 2010). Integrating human-technology hybrid workflows can boost output capacity by 30-50% without proportional headcount increases (Supriadi, Maghfiroh, & Abadi, 2023). Despite clear advantages, adoption faces cost, skill, and integration barriers. TA Enterprise's phased implementation plan aims to mitigate these risks, ensuring incremental efficiency gains and growth (Doyle, 2024).

Organization Context

Within the TOE Framework, TA Enterprise's strong commitment to manual craftsmanship acts as a cognitive filter, fostering skepticism towards digital advantages and amplifying concerns about complexity. This tradition, coupled with hierarchical and generational dynamics, leads to resistance, as older employees often defer younger generations' digital proposals, prioritizing stability over innovation (Rogers, 2003). To mitigate this, tradition can be reframed as an asset by integrating digital enhancements that respect legacy practices (Armenakis & Harris, 2009). Strategic training, tailored to existing competencies, is crucial for bridging generational skill gaps, despite financial costs and potential productivity dips. Younger family members are vital digital champions. Given limited human capital in a small team, digital initiatives must be carefully sequenced to avoid overwhelming staff,

ensuring adequate support and "right-sized" solutions (Asia-Pacific Economic Cooperation, 2023).

Environment Context

TA Enterprise faces evolving customer demands for rapid digital interfaces and a professional web presence, with market trends favoring interactive signage that boosts engagement (PWC, 2023) (Chaffery, 2020) (Kannan & Li, 2017). Competitive pressure from digitally adept rivals intensifies the need to modernize, as outdated offerings lead to lost opportunities (PWC, 2023). Benchmarking against international markets provides strategic insights for scalable solutions (Porter & Heppelmann, 2014). Government support programs significantly shape TA Enterprise's external environment by lowering financial barriers and incentivizing SME digital adoption. These measures offset upfront technology costs. Despite grants, bureaucratic complexities deter many small businesses. However, clear regulatory frameworks and public endorsement foster commitment (MDEC, 2022). Beyond financial aid, government-sponsored training and co-funding initiatives like the Madani Digital Grant directly alleviate financial limitations by subsidizing technology investments (MIDF, 2023).

Recommendations for the application of research results

The following are the recommendations derived from this study for Small and Medium Enterprises (SMEs) based on identified priorities:

Short Term (0-12 months)

1. Adopt a phased approach to facilitate the development of confidence and illustrate tangible benefits.
2. Implement a role-based digital literacy training program to mitigate skill gaps.
3. Apply for government grants to alleviate the costs associated with digital technology investments.

Mid-Term (1-3 years)

1. Explore and invest in interoperable systems, such as cloud-based inventory software.
2. Digitize existing manual operations to ensure scalability and manageability.
3. Leverage available government or external training opportunities to enhance employee skills.

Long Term (3-5 years)

1. Integrate advanced technologies, including artificial intelligence (AI) and the Internet of Things (IoT), to enhance savings and improve efficiencies.
2. Recruit employees with strong technological literacy to bolster overall digital readiness.

Recommendation for Policymaker

For the Malaysian government, simplifying grant procedures and enhancing transparency are recommended to boost SME uptake. Tiered funding, hands-on training, and advisory services can accelerate sustainable digital transformation by integrating financial aid and skill development, especially for micro and small enterprises.

Recommendations for Future Research

For future research, it is suggested that this approach be replicated across various sectors and regions, including rural and East Malaysian SMEs, to validate and enhance the findings. Longitudinal studies tracking the evolution of digital maturity and the effects of environmental changes would further deepen the understanding of SME digital transformation,

ultimately directing more effective policy and practice in Malaysia's dynamic business landscape.

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