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Digital Transformation in Small and Medium Enterprises (SMEs) in Vietnam

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Abstract

The digital transformation of small and medium enterprises (SMEs) in Vietnam has progressed significantly in recent years, though it remains constrained by several barriers. Earlier studies revealed that most SMEs were unprepared for Industry 4.0, but surveys after the COVID-19 pandemic show a growing readiness, driven by the clear benefits of digital adoption such as higher productivity, reduced costs, better customer engagement, and expanded market reach. Despite this progress, SMEs continue to face major challenges including limited financial capacity, weak IT infrastructure, shortage of digital skills, and difficulties in changing long-established business habits. The Vietnamese government has introduced multiple supportive policies and national programs to accelerate SME digitalization, ranging from strategic frameworks to practical initiatives like

providing local digital platforms and readiness assessments. Recent quantitative research on SMEs highlights that technological infrastructure, leadership, and well-defined digital strategies play the most influential roles in shaping digital transformation, with the intention to adopt digital solutions acting as a critical mediating factor. Complementary qualitative studies also emphasize the cultural and managerial hurdles SMEs encounter, such as resource constraints and resistance to data-driven decision-making, though leaders increasingly recognize the long-term value of digital tools for planning and competitiveness. Overall, while challenges remain, Vietnam's SMEs are gradually building the momentum needed to succeed in the digital era.

Keywords: Regulatory Technology (RegTech), Cross-border Compliance, Artificial Intelligence in Finance, Multi-jurisdictional Risk Management, FinTech Governance

1. Introduction

Digital transformation refers to the integration of digital technologies into all aspects of business operations, fundamentally altering how firms deliver value to customers and compete in the market. According to Gartner, "*digital transformation is the use of digital technologies to change business models, create new opportunities, revenue and value.*" In practice, this means rethinking how organizations combine people, data, and processes through technology to generate novel value propositions multiresearchjournal.com. Over the past decade, enterprises worldwide have pursued digital transformation to improve efficiency, innovation, and adaptability in the face of rapid technological change. For small and medium enterprises, digital transformation is not just an opportunity but a necessity to remain competitive, especially as industries embrace the Fourth Industrial Revolution (Industry 4.0) and as consumer behaviors shift toward digital channels.

SMEs play a pivotal role in most economies, and Vietnam is no exception. In Vietnam, SMEs (including micro-sized firms) account for roughly 97% of all enterprises and employ a significant majority of the workforce. As of 2021, private enterprises (the category under which most SMEs fall) contributed about 46% of GDP on average and nearly 50% of employment, underscoring their importance in Vietnam's socio-economic development. Recognizing this, the Vietnamese government has launched ambitious initiatives to promote SME growth and competitiveness. For example, Resolution 45/NQ-CP (2023) sets goals to expand the business sector to 1.5 million enterprises by 2025 and 2 million by 2030, with the private sector targeted to contribute 55% of GDP by 2025. Achieving these goals in the modern era is closely linked with digital transformation, as SMEs must leverage technology to scale up, innovate, and integrate into global value chains.

Vietnam's commitment to digital transformation is exemplified by its National Digital Transformation Program to 2025, with orientation to 2030, approved in 2020. This national strategy is built on three pillars – *Digital Government*, *Digital Economy*, and *Digital Society* – and sets concrete targets such as the digital economy reaching 20% of GDP by 2025 and 30% by 2030.

Key initiatives under this program include developing e-government services, promoting a “Make in Vietnam” approach to encourage local technology innovation, and investing in digital infrastructure like broadband and 5G networks. These efforts indicate strong political will to create an ecosystem where businesses, including SMEs, can thrive in a digital era.

Despite high-level commitments and the clear potential benefits of digitalization, many Vietnamese SMEs lag in digital transformation. Preliminary surveys and reports suggest that a substantial portion of SMEs have been slow to adopt digital tools beyond basic uses, and a significant number find it challenging to implement comprehensive digital changes. Issues such as limited awareness of digital solutions, resource constraints, and organizational resistance are frequently cited barriers. For instance, a recent World Bank study noted that only a small fraction of Vietnamese firms had begun digital transformation “in earnest,” with manufacturing SMEs particularly trailing, partly due to gaps in management quality and capability. This signals that without addressing underlying challenges, there is a risk that many SMEs could be left behind in Vietnam’s digital economy surge.

Objectives and Scope: This article seeks to provide a comprehensive analysis of digital transformation in Vietnamese SMEs, blending both international and local perspectives. It will review relevant literature to identify the benefits of SME digitalization and the common obstacles encountered globally and in Vietnam. It will also discuss theoretical frameworks that help explain how and why SMEs undertake digital transformation, which will inform a structured analysis of the factors influencing success in this domain. Further, the paper will examine current policy measures in Vietnam aimed at supporting SME digital uptake, and discuss what policy adjustments or enhancements could better facilitate this process. On the practical side, it proposes strategic frameworks or step-by-step approaches that SME managers can adopt to implement digital transformation effectively, considering Vietnam’s specific business context. Challenges unique to or pronounced in Vietnam’s SME sector will be highlighted in a dedicated section, acknowledging issues such as financing, human capital, technological infrastructure, and cultural mindset. Finally, the conclusion will synthesize the insights and suggest future directions for research and policy. By addressing both policy and practice, the article aims to contribute actionable knowledge that can help bridge the digital gap for SMEs in Vietnam.

2. Literature Review

2.1 International Perspective on SME Digital Transformation

Global Trends and Importance: Across the globe, the digitalization of SMEs has been recognized as a catalyst for improved performance and innovation. Embracing digital technologies allows smaller firms to streamline operations, reach broader markets, and compete more evenly with larger enterprises. The OECD observes that digital tools can “improve performance, spur innovation, enhance productivity and compete on a more even footing with larger firms”. In recent crises such as the COVID-19 pandemic, digitally-savvy SMEs proved more resilient, using e-commerce, cloud platforms, and teleworking software to adapt to disruptions. These experiences underline that digital

transformation is closely tied to SME resilience and long-term viability.

Benefits and Opportunities: For SMEs, even incremental adoption of digital solutions can yield significant benefits. Cloud computing and enterprise software (e.g. accounting, customer relationship management systems) can automate routine tasks and reduce costs. Online marketing and e-commerce enable SMEs to access new customer segments beyond their immediate geographic area. Data analytics can provide insights for better decision-making, while emerging technologies like AI and Internet of Things (IoT) open avenues for innovative products and business models. Studies have shown that firms effectively using digital technologies often experience higher productivity growth and can more rapidly innovate their business models. Notably, Cenamor *et al.* (2019) found that social media and online platforms help SMEs grow locally and internationally by connecting with customers and partners more efficiently. Moreover, the drive for digital transformation is often linked to gaining competitive advantage – new technologies are seen as “tremendous potential for driving innovation and competitive advantage”. Thus, around the world, SME digitalization is increasingly viewed as essential for sustaining competitiveness in a digital economy.

Common Barriers and Challenges: Despite clear advantages, SMEs globally continue to lag behind larger firms in digital transformation. The smaller the firm, the higher the barriers to adopting new technologies. Key constraints documented across many countries include limited internal resources (financial and human), lack of digital know-how, and organizational inertia. Many SMEs operate with tight budgets and cannot easily invest in new IT infrastructure or specialized talent. In addition, owners or managers may not be fully aware of digital solutions or may underestimate their relevance. According to the OECD, low awareness and skill deficiencies are primary reasons for slow digital uptake in SMEs. Skill gaps are a pervasive issue – employees (and sometimes managers) often lack the IT skills needed to implement and utilize digital tools, and SMEs struggle to attract or afford qualified IT personnel. This human capital gap means many SMEs do not have the capability to manage more complex digital projects. Indeed, continuous upskilling is “essential in a rapidly evolving digital landscape,” yet most SMEs lack training capacity and proper understanding of areas like data analytics or cybersecurity.

Infrastructure and Access Issues: Another common challenge is the access to reliable and affordable digital infrastructure. SMEs, especially in developing regions or rural areas, may face inadequate broadband connectivity or higher relative costs for internet and IT equipment. The OECD notes that uneven access to fast broadband – particularly the urban-rural divide – continues to limit SMEs in fully capitalizing on digital opportunities. Without quality internet connectivity, for instance, cloud-based services and e-commerce become difficult to use. This creates a “digital divide” where SMEs in less developed areas fall further behind. Additionally, concerns around digital security and data privacy can be obstacles. Many small businesses are unsure how to protect themselves against cyber threats, and the complexity of digital security measures can be daunting without expert help. Awareness campaigns and toolkits are

often recommended to raise SME capabilities in digital security.

Organizational and Cultural Factors: The literature also highlights internal organizational barriers. SME leaders might resist change, especially if a business has operated successfully for years without digital tools. Introducing new technologies can disrupt established workflows, and employees may fear that automation or digital systems will reduce their control or even threaten jobs. Organizational culture that is change-averse will impede digital initiatives. Mueller (2021) found that employees who worry about losing autonomy or who distrust new technologies can actively or passively resist digital changes. Such resistance often leads to failures in implementation, even when technology is available. Thus, beyond the technological aspect, “*the complex interplay of forces, institutional and cultural*” factors can determine whether a digital transformation effort succeeds or fails. Building a pro-digital mindset and a culture open to experimentation (and occasional failures) is crucial in SMEs.

Global Policy Emphasis: Recognizing SMEs’ structural disadvantages, governments and international bodies have prioritized support for SME digitalization. Programs exist in many OECD countries to provide training, funding, and advisory services for SMEs adopting digital tech. For example, during the pandemic, several governments partnered with large tech firms to offer free or subsidized digital tools to SMEs, aiming to bridge the gap. The OECD’s Digital for SMEs (D4SME) initiative is one such effort to coordinate knowledge sharing and policy guidance globally. Common policy measures include grants or tax incentives for technology investments, support in developing digital strategies, and building digital innovation hubs that connect SMEs with expertise and resources. These interventions stem from the understanding that SME digital transformation not only benefits the firms themselves but also has broader economic impacts, enhancing overall innovation, job creation, and competitiveness in the economy.

In summary, the international literature paints a picture where SME digital transformation is a game-changer for performance and resilience, yet it is constrained by enduring challenges. Low awareness, limited skills, scarce resources, and infrastructure gaps are recurrent themes across countries. Overcoming these barriers often requires concerted efforts at multiple levels: firms need internal drive and capacity-building, while governments and larger ecosystem players should provide an enabling environment. The next section will examine how these global patterns compare to the situation in Vietnam, noting both similarities and unique local aspects.

2.2 Vietnamese Perspective and Context

State of SME Digitalization in Vietnam: Vietnam’s SME sector, as noted, forms the backbone of its economy, making their digital transformation particularly impactful on national development. Over the last few years, Vietnam has witnessed a growing discourse on “*Chuyển đổi số*” (digital transformation) for businesses, with various studies and government reports assessing progress. One salient observation is that Vietnam’s SMEs are generally still at early stages of digital transformation. A World Bank-backed research by Cirera *et al.* (2021) reported that only a small number of Vietnamese firms have truly embarked on digital

transformation, and among those, the manufacturing sector lags the most. Traditional manufacturing SMEs often rely on outdated machinery and processes – indeed, around 80% of machinery in use by Vietnamese enterprises is imported old technology from the 1980s-1990s. This technological gap indicates a heavy reliance on basic or obsolete technology, which hinders advanced digital integration.

Local surveys provide further insight. According to Vietnam’s Business White Paper 2022, while the number of enterprises is growing, the level of technology adoption among SMEs remains limited in scope. By the end of 2021, Vietnam had 857,551 operating enterprises (an increase of 5.7% from 2020), with over 96% classified as micro, small, or medium. However, many of these SMEs use technology only for rudimentary tasks. For example, a large proportion has access to the internet and uses basic office software or social media, but far fewer have integrated enterprise resource planning (ERP) systems or data analytics. The Vietnam E-Commerce Association reports that only ~14% of SMEs use enterprise management software (like ERP), compared to about 40% of large firms that do so. Likewise, investments in digital initiatives (such as building websites or mobile apps) account for less than 20% of total capital in most SMEs, whereas large companies might allocate over 20-50% of their capital to digital projects. These figures illustrate a significant digital maturity gap between small and large enterprises in Vietnam.

Encouragingly, awareness of digital transformation has been rising among Vietnamese SMEs, in part due to government promotion and the experiences during COVID-19. The pandemic acted as a catalyst for some SMEs to experiment with digital tools (e.g., selling on e-commerce marketplaces, using Zoom for meetings, adopting cashless payments) in order to survive lockdowns and supply chain disruptions. A report by the Ministry of Planning and Investment (MPI) and USAID LinkSME project (2022) found that prior to COVID-19, only about 30% of Vietnamese enterprises had started any form of digital transformation process. During the pandemic, many rushed into deploying digital solutions; however, these efforts were not always sustained. The same report noted that 48.8% of 1,000 surveyed enterprises had tried some digital transformation solutions but later discontinued them because the solutions were either unsuitable or were adopted only as stop-gap measures during COVID and then deemed unnecessary afterwards. This points to issues of poor strategic alignment or lack of long-term commitment—SMEs may have adopted tech in haste without proper planning or skills, leading to abandonment once immediate pressures eased.

Another study focusing on Hanoi SMEs (Minh *et al.*, 2024)^[7] highlighted that research on SME digital transformation in Vietnam is still limited, often confined to assessing “digital readiness” rather than deeper factors affecting the transformation process. That study, which surveyed 456 SMEs in Hanoi, identified *six key factors* influencing digital transformation: managerial attitude and capabilities, digital transformation strategy, employee capability, organizational culture, technology infrastructure, and external pressure (market or competitive pressure). Notably, it found these factors often influence outcomes indirectly by shaping the intention to transform, aligning with the Theory of Planned Behavior (where intention precedes action). This suggests that even when resources or technology exist, the mindset and intent of SME leaders play a critical role in driving

actual transformation. Indeed, Minh *et al.* (2024) ^[7] report that as many as 57.6% of SMEs in Vietnam face challenges in implementing digital transformation, citing limited resources, outdated technology, and workforce skill gaps as core issues.

Challenges Specific to Vietnamese SMEs: Vietnamese sources echo many global challenges but also reveal context-specific nuances. Surveys by the Vietnam Chamber of Commerce and Industry (VCCI) emphasize that Vietnamese SMEs have generally low levels of technology and innovation. Apart from using old machinery, lack of digital skills and human resources is a prominent barrier. For instance, a Cisco Asia Pacific SME Digital Maturity study noted that in Vietnam about 17% of SMEs cited a lack of digital skills/personnel as a major hurdle. Other significant barriers identified were the absence of a strong IT platform (16.7%) to build upon and weak digital culture or mindset within the enterprise (15.7%). These factors are interrelated – without IT infrastructure and skilled people, SMEs cannot fully utilize advanced technologies; without a digital mindset, firms may not even seek out such opportunities.

Furthermore, Vietnamese SMEs often suffer from information gaps – they lack information on what digital solutions are available and suitable. According to one study, about 30.4% of SMEs report insufficient information on digital technologies as a difficulty. Coupled with that is a shortage of in-house expertise: 32.3% say they lack internal human resources to implement digital tech, reflecting the talent constraint. Many SME owners also express fear of data security risks (about 33.9% are concerned about data leaks), which can make them hesitant to move operations online or adopt cloud services. Infrastructure issues, like unstable internet or lack of appropriate digital technology infrastructure, were cited by 38.9% of SMEs. But perhaps the most immediate concern is cost: over half (55.6%) of SMEs in a survey indicated that the high cost of digital technology adoption is a severe challenge. This aligns with the fact that many SMEs operate on thin margins and view digital investments as risky or burdensome without clear short-term returns.

Crucially, surveys also reveal that many Vietnamese SME managers have misconceptions or limited awareness regarding digital transformation. A considerable number have not seen the need for digital transformation at all, often thinking it is only relevant for large corporations. According to experts, SMEs commonly hold four mistaken beliefs: (1) digital transformation is only for big companies; (2) it always requires very large expenditures; (3) it should be implemented all at once as a quick overhaul; and (4) it is a “magic wand” that will automatically yield success. These misconceptions can lead to either inaction (in the first and second cases) or improper action (third and fourth cases). For example, some SMEs attempted to deploy too many new technologies too quickly without adequate preparation (“deploy as much as possible, as fast as possible”), which can overwhelm the organization. Others fail to recognize that incremental steps, like selling on e-commerce platforms or using simple automation tools, are part of the digital transformation journey – they might already be doing it in pieces but don’t realize its significance. This indicates a need for greater awareness and education around what digital transformation entails and how to approach it strategically.

Recent Empirical Research in Vietnam: Recent academic studies provide data-driven insights. For instance, a 2025 study in the Mekong Delta (Luu *et al.*, 2025) ^[8] applied a combined Technology-Organization-Environment (TOE) framework and Diffusion of Innovations (DOI) theory to examine factors influencing SMEs’ digital transformation decisions. That study, surveying SMEs in Can Tho city, identified seven key factors: relative advantage of new technology, organizational readiness, competitive pressure, government support, technology compatibility, managerial support, and pressure from partners/consumers. Consistent with theory, the perceived *relative advantage* (the tangible benefits of adopting digital solutions) was the most influential positive driver, indicating that SMEs are motivated when they clearly see value addition. Interestingly, pressure from partners and consumers showed a negative relationship with digital transformation in that context. The authors suggest this might be because excessive external pressure creates challenges for SMEs with limited resources – they may find it difficult to meet digital demands from larger partners or evolving customer expectations, resulting in a strain rather than a catalyst. Nonetheless, government support and managerial support emerged as facilitators, implying that supportive policies and proactive leadership can significantly encourage SMEs to take on digital initiatives.

Another study (Nguyen *et al.*, 2023) ^[10] on dynamic capabilities in Vietnamese SMEs found that firms with better IT infrastructure and proactive government policy support tend to have higher innovation performance and are more prepared to digitally transform. It is noted that Vietnam’s policy environment historically favored state-owned enterprises (SOEs), sometimes to the detriment of SMEs’ development. This structural context means private SMEs often had less access to capital and technology. However, current policies are shifting to recognize SME needs, as detailed later. Research by Walsh *et al.* (2023) pointed out that government support needs to be more inclusive of SMEs, as too much focus on a few large “national champion” firms can squeeze out SME participation in the digital economy.

Summary of Vietnamese Perspective: In summary, Vietnamese SMEs are increasingly aware of digital transformation and some progress has been made (particularly under the impetus of COVID-19 and government advocacy), but the overall pace is slower than expected and uneven across sectors. Many SMEs remain in a digitally nascent stage. The challenges they face mirror global issues – lack of finance, skills, and strategic know-how – but are often compounded by local factors such as widespread use of outdated technology, a business culture still learning to embrace change, and policy support mechanisms that are in development. By the end of 2022, it was reported that around 20% of surveyed enterprises had no budget at all for digital transformation, and an additional 43% had some budget but found it insufficient for their needs. Only about one-third had allocated adequate resources to meet their digital transformation needs fully. This financial indicator clearly underscores why cost is seen as a major barrier in Vietnam. Additionally, only about 30% of firms reported they could find and hire the skilled workers needed for e-commerce or IT roles, indicating a 70% gap in necessary human resources.

The literature from Vietnamese sources consistently calls for more robust support systems and internal capability development to overcome these hurdles. As we move to the theoretical framework section, we will build on these findings to conceptually understand what drives or impedes SME digital transformation, setting the stage for discussing policies and practical strategies to support Vietnam's SMEs in their digital journey.

3. Theoretical Framework

Digital transformation in SMEs can be analyzed through multiple theoretical lenses that help explain the drivers, processes, and outcomes of technology adoption at the firm level. In academic literature, no single unified theory covers all aspects of digital transformation, but several frameworks and models are relevant. This section outlines key theoretical underpinnings, and proposes an integrated framework suitable for examining SME digital transformation in the context of Vietnam.

Stages of Digital Transformation: It is useful to recognize that digital transformation is not a one-time event but a process that often unfolds in stages. A common conceptualization breaks it down into: digitization (converting analog information to digital form), digitalization (using digital technologies to improve existing business processes and operations), and digital transformation (reinventing business models and strategies through digital means). Minh *et al.* (2024) [7] describe this continuum for enterprises as moving from basic IT adoption to more advanced integration and finally to transformative change in products and processes. Many SMEs start at the digitization phase (for example, moving record-keeping from paper to Excel), progress to digitalization (using an e-commerce site or ERP system to streamline sales and operations), and only a few reach full transformation (offering entirely new digital services or fundamentally changing their value proposition). This staged view underscores that different factors might be important at different stages – for instance, basic infrastructure and skills are critical at early stages, while strategic vision and culture become critical at later transformative stages.

Technology-Organization-Environment (TOE) Framework: A widely used framework in studying technology adoption by firms (especially SMEs) is the TOE framework (Tornatzky & Fleischer, 1990). TOE posits that three context dimensions influence a firm's adoption of new technology:

Technological context: the availability and characteristics of technologies (e.g., relative advantage, complexity, compatibility) that the firm could adopt. For digital transformation, this includes the suitability of digital solutions to the SME's business, the maturity of those technologies, and the firm's existing IT infrastructure. In Vietnam, for example, the compatibility of new digital tools with local business practices or legacy systems can be an important consideration (as suggested by the Mekong Delta study noting "compatibility" as a factor).

Organizational context: the attributes of the firm that affect adoption, such as size, resources, top management support, staff expertise, and organizational culture. In SMEs, organizational factors often dominate—managerial attitude and knowledge, employee skill levels, and internal processes determine readiness for digital change. A supportive leadership that actively champions digital initiatives

(analogous to managerial support) and an adaptable, learning-oriented culture are positive forces, as multiple studies confirm. Conversely, if an SME lacks financial resources or has rigid routines, those are organizational constraints.

- **Environmental context:** the external environment pressures and supports technology adoption, including industry competition, customer demands, supplier and partner networks, and government policy/regulation. For Vietnamese SMEs, environmental factors have been significant: competitive pressure (e.g., needing to digitalize to keep up with competitors or meet the expectations of multinational clients) can push firms toward transformation. Government policies and infrastructure are another external factor – supportive policies or incentives (like training programs, grants) can facilitate adoption, whereas regulatory uncertainty or lack of internet infrastructure can hinder it.

Using TOE as a base, one can systematically analyze the enablers and barriers of digital transformation for SMEs. It aligns with findings such as those from Luu *et al.* (2025) [8] where factors like relative advantage and compatibility (technology), organizational readiness and managerial support (organization), and government support and competitive pressure (environment) all play a role in the decision to transform. TOE is particularly useful in the Vietnamese context to ensure that we consider not just firm-internal issues but also the broader ecosystem, including policy environment and market conditions.

Diffusion of Innovations (DOI): Everett Rogers' Diffusion of Innovations theory complements the TOE by focusing on how certain characteristics of an innovation influence its adoption rate. Key attributes include relative advantage, complexity, compatibility, trialability, and observability. In SME digital transformation, *relative advantage* (the perceived benefit over current practice) is crucial – if an SME owner perceives a clear advantage (e.g., "using a cloud inventory system will reduce stock costs by 20%"), they are more likely to adopt it. *Complexity* of digital tools (if they are seen as too difficult to use) can deter SMEs. *Trialability* (ability to test on a small scale) and *observability* (seeing peers successfully implement) can encourage adoption. Vietnamese SMEs often look to success stories or case studies of similar businesses; seeing a peer go digital successfully can alleviate uncertainty. In fact, the government and business associations have shared "successful digital transformation case studies" as part of awareness campaigns, implicitly leveraging the observability principle to inspire others.

Theory of Planned Behavior (TPB) and Technology Acceptance Model (TAM): While TOE/DOI look at structural and innovation-specific factors, theories like TPB (Ajzen, 1991) and TAM (Davis, 1989) bring in the cognitive and behavioral angle. TPB suggests that an individual's intention to perform a behavior (here, an organization's decision-maker's intention to pursue digital transformation) is influenced by their attitude toward the behavior, subjective norms (pressure from others), and perceived behavioral control (ease or difficulty of doing it). In the SME context, if a manager believes digital transformation is beneficial (positive attitude), perceives that competitors or partners expect it (normative pressure), and feels confident in executing it (high perceived control due to skills/resources), the intention to implement will be strong.

The Hanoi SME study essentially applied a TPB logic: they found the effect of various factors (like infrastructure, culture, etc.) was largely *indirect* by influencing the “digital transformation intention” of the firm’s leaders, which in turn drives actual transformation. This underscores how important the mindset and intention of SME owners are – it can mediate the impact of other variables. TAM, on the other hand, zeroes in on two beliefs – perceived usefulness and perceived ease of use of a technology – which affect an individual’s technology acceptance. Although TAM was originally for individual user adoption, its concepts can translate to SMEs: an SME owner must perceive a new digital system as useful for the business and relatively easy (or feasible) to implement, otherwise they will resist adoption. TAM also highlights that even if an innovation is objectively beneficial, if it is seen as too complex or not user-friendly, adoption will stall. For SMEs with limited IT expertise, *ease of use* can be a deciding factor in choosing simpler digital tools over complex enterprise systems.

Resource-Based View (RBV) and Dynamic Capabilities: Another theoretical angle is the Resource-Based View, which posits that a firm’s competitive advantage comes from its unique resources and capabilities. In digital transformation, IT capability is a strategic resource. SMEs that build strong IT capabilities (infrastructure, IT skills, data management) can leverage digital technologies more effectively to improve performance. Bharadwaj (2000) argues that IT capability (a combination of IT infrastructure, human IT skills, and ability to leverage IT for business) can lead to superior firm performance. For SMEs, developing even a modest but fit-for-purpose IT capability can enable them to utilize digital tools in ways that differentiate them (for example, using data analytics to offer personalized services in a niche market). The concept of dynamic capabilities (Teece, 1997; Warner & Wäger, 2019) extends RBV by focusing on the ability to integrate, reconfigure, and renew resources in rapidly changing environments. Digital transformation is inherently a dynamic process – technologies and market conditions evolve, so SMEs need the capability to learn and adapt continuously. A dynamic capability perspective suggests that beyond adopting any single technology, SMEs must cultivate processes for ongoing innovation and change (e.g., continuously upgrading skills, experimenting with new digital business models). Studies have noted that SMEs which actively invest in digital skills and flexibility can better seize new opportunities and thus improve innovation performance. In Vietnam’s fast-growing digital economy, SMEs with strong dynamic capabilities (ability to sense new tech trends, seize opportunities, and reconfigure their operations accordingly) are likely to outperform those that remain static.

Integrative Framework for Analysis: Combining the above, this paper adopts an integrative theoretical framework to analyze Vietnamese SME digital transformation. The framework acknowledges multi-level factors:

- **Technological factors:** Perceived relative advantage and compatibility of digital solutions; availability of affordable technologies; quality of digital infrastructure (e.g., internet connectivity).
- **Organizational factors:** Leadership attitude and intention (shaped by awareness and perceived ease/usefulness), availability of financial and human resources, employee digital skills, and organizational

culture readiness for change. These align with TPB/TAM notions (intention, attitudes) and RBV (resource endowments).

- **Environmental factors:** Market forces (competitive and customer pressure), support from business partners (or conversely, demands from large partners), and importantly, government policy/incentives and institutional support.

Dynamic capabilities act as a moderating lens – firms with better learning and innovation processes can overcome constraints more effectively. For example, a resource-poor SME with a strong learning culture might find creative low-cost ways to digitize, whereas a resource-rich but inflexible SME might fail to use its resources well.

This theoretical grounding will inform the subsequent discussion on policy and practical strategies. It highlights why policies need to address not just external incentives but also knowledge and skill-building (to influence attitudes and perceived control), and why SME managers should focus on cultivating internal capabilities and a supportive culture. In essence, successful digital transformation in SMEs is an interplay of having the right technology (suitable and accessible), the right organizational conditions (prepared people, resources, mindset), and the right environment (external push and support), with a feedback loop of learning and adaptation throughout the process.

4. Discussion of Policy Implications

Government policy plays a pivotal role in shaping the digital transformation landscape for SMEs. In Vietnam, the government has been an active promoter of digital transformation, recognizing it as a national priority. However, the effectiveness of policies depends on how well they address the specific needs and challenges of SMEs. This section evaluates Vietnam’s current policy environment related to SME digitalization and discusses implications for policy improvement, drawing on both the successes and gaps identified by research.

National Strategy and Government Commitment: As mentioned, Vietnam’s National Digital Transformation Program (Decision No. 749/QĐ-TTg, 2020) sets an overarching vision with clear targets for 2025 and 2030. This strategy demonstrates strong commitment at the highest level and sends an important signal to all stakeholders. One direct implication is that ministries and local authorities have been developing action plans to align with this national program. For example, the Ministry of Information and Communications (MIC) coordinates many digital initiatives and collaborates with other ministries (Industry, Education, Planning & Investment, etc.) to implement sector-specific digital plans. Policy consistency and inter-ministerial coordination are crucial so that SMEs receive coherent support rather than fragmented efforts. Early evidence of policy action includes: the E-Government Development Strategy (to improve online public services relevant to businesses), the “Make in Vietnam” campaign (to support domestic digital tech companies that can serve local business needs), and investments in telecom infrastructure like expanding broadband and 5G. These create a more enabling environment – for instance, better e-government services simplify business procedures, and better connectivity reduces infrastructure barriers for SMEs in remote areas.

Legal and Regulatory Environment: Despite these strategic efforts, scholars and industry experts note that Vietnam's legal framework related to digital business is still evolving and at times lagging behind technological change. There are areas that lack clear regulations or standards, such as data privacy/protection, e-commerce consumer protection, and frameworks for emerging tech (cloud computing policies, AI ethics, etc.). The absence of robust legal "corridors" for things like data sharing between government and businesses, or using digital signatures across platforms, can hinder SMEs from fully utilizing digital tools. For example, if an SME wants to integrate with a government open data platform or use cloud services, unclear regulations on data security might make them hesitant or limit what they can do. **Policy implication:** The state needs to continuously update and improve the legal environment to keep pace with digital transformation. This includes passing and enforcing laws on cybersecurity, data protection (Vietnam is working on a Personal Data Protection decree), electronic transactions, and intellectual property in the digital realm. A more agile regulatory approach could be adopted – such as sandboxes for fintech or e-commerce – allowing innovation while managing risks. As the literature suggests, slow or outdated legislation *"greatly hinders the digital transformation of the business community"*, including SMEs. Therefore, accelerating legal reforms in digital domains should be a priority.

SME-Specific Support Programs: The Vietnamese government has introduced various programs targeting SME development (e.g., the SME Support Law 2017 and its related decrees). Many of these include components for technology and digital support. For instance, the Ministry of Planning and Investment's SME Development Fund and other provincial funds offer financial assistance for SMEs investing in innovation. In recent years, there have been specific initiatives like providing free digital transformation consultations for SMEs, setting up online portals with guidance, and partnering with tech companies to offer discounted software packages. *Hanoi city* provides a case in point: policies in Hanoi have offered SMEs support in terms of easier credit access for tech upgrades, training courses on digital skills, and facilitation of technology transfer from universities. A 2024 survey of 900 Hanoi SMEs found that over half of respondents felt these local policies were timely and effective in boosting operational efficiency. This indicates that well-designed support measures (especially those addressing finance and skills) are appreciated by SMEs and can yield positive outcomes.

However, research also highlights shortcomings. Many SMEs, especially micro and informal ones, are not effectively reached by government programs. Complex application procedures and stringent eligibility criteria often mean that only a minority of SMEs benefit from grants or training on offer. Additionally, Vietnam's large informal sector means numerous micro-SMEs are unregistered and thus outside official support channels. Policy implication here is two-fold: simplify and broaden access to SME support, and find ways to include or encourage the informal businesses to formalize or participate. Bureaucracy reduction is critical – for example, moving from an "application-approval" mechanism (which can be slow and intimidating for small businesses) to more automatic or decentralized support. As one source suggests, support policies should *"overcome the 'application-approval' mechanism, thereby removing the hesitation of this business sector when accessing incentives"*. This might involve, for example, providing tax credits for any SME that invests in approved digital solutions (thus no lengthy application needed – it's claimed when filing taxes), or using industry associations to channel support in bulk.

Financial Incentives and Infrastructure Investment: One of the biggest needs for SMEs is financial support to alleviate the cost burden of digital transformation. The government can approach this through tax incentives (e.g., allowing accelerated depreciation of IT equipment, or tax deductions for expenses on software and training) and direct subsidies or low-interest loans for digital projects. Given that 20% of SMEs report zero budget for digital transformation and another 43% have inadequate budget, easing the financial strain can have a significant impact. The policy implication is that targeted financial instruments could boost the number of SMEs initiating digital projects. For instance, grants matching a portion of SME investments in approved technologies could encourage more adoption. Additionally, improving IT infrastructure (especially internet access in rural and industrial zones) is largely a government responsibility that hugely benefits SMEs. Vietnam has made progress in expanding broadband, but smaller firms in rural provinces still suffer from connectivity issues. Public-private partnerships to roll out broadband and 5G to underserved areas will directly reduce one barrier identified (the "limited access to fast, affordable digital infrastructure"). A recommended policy action from researchers is that the government *"proactively improve the IT infrastructure designed specifically for SMEs"* through measures like investing in digital hubs, offering free or subsidized basic cloud infrastructure, or creating common platforms SMEs can use.

Training and Capacity Building: Many of the challenges boil down to human capital deficits. Thus, a critical policy implication is the need for large-scale training and upskilling programs. The government, possibly in collaboration with universities and IT firms, should expand programs that train SME owners and employees in digital skills (ranging from basic digital literacy to more advanced areas like digital marketing, data analysis, cybersecurity awareness). Already, initiatives like the Ministry of Industry and Trade's e-commerce training roadshows and MIC's digital skills events exist, but they may need to be scaled up and made more accessible online for wider reach. Another approach is to integrate digital business modules into existing SME mentoring or incubation programs.

Knowledge Sharing and Platforms: The government and business associations can also facilitate knowledge exchange platforms. For example, creating an SME digital transformation portal or network where SMEs can share experiences, learn best practices, and find vetted technology partners can address the information gap. As noted, 69% of SMEs didn't know which partners to approach for digital solutions and 72% did not know how to begin their digital transformation. In response, authorities could certify certain IT service providers or maintain a directory of solutions proven effective for SMEs in various sectors. Some countries have implemented "digital SME academies" or helpdesks – Vietnam could consider similar mechanisms.

Fostering an Ecosystem and Collaboration: Policies should also encourage collaboration between SMEs and large enterprises or tech startups. Large firms can mentor or include SMEs in their digital supply chains. Vietnam's relatively weaker startup ecosystem (ranked 63rd by ADB's digital startup index) suggests room for improvement in fostering innovation. The policy implication is to create a more attractive environment for digital startups (e.g., via startup incubators, innovation grants, venture funding support), which in turn can provide more solutions tailored to SME needs. Additionally, collaborative forums where small and big businesses, tech experts, and financiers meet can spark partnerships. The OECD emphasizes that cooperation among government, large companies, financial institutions, and SME associations can "*accelerate the digital transition of SMEs, bridging the digital divide between large and small companies.*" This holds true for Vietnam: multi-stakeholder partnerships, such as the existing USAID LinkSME program which connects SMEs with supply chain opportunities, should be continued and expanded with digitalization as a focal point.

Monitoring and Evaluation of Policies: Finally, a policy implication for the government is to rigorously monitor the outcomes of its digital transformation initiatives for SMEs and be willing to adapt. For instance, if training programs are under-utilized, find out why (timing, content, outreach?) and adjust them. If grants are not reaching the smallest businesses, perhaps micro-loans or different financing vehicles are needed. The dynamic nature of technology means policies also need to be dynamic and evidence-based. By engaging with academia and industry, policymakers can stay informed about what works and what doesn't. The literature suggests that while Vietnam has many policies on paper, the *uneven effectiveness* calls for better implementation and feedback loops.

In conclusion, Vietnam's policy environment has laid a strong foundation by prioritizing digital transformation nationally and introducing various supportive measures. The next step is fine-tuning and intensifying these efforts to specifically lift SME capabilities. Simplifying access to support, increasing financial and technical assistance, ensuring robust legal frameworks, and fostering a collaborative ecosystem are all important implications derived from current research. When government policy is actively engaged and responsive, it creates a "*favourable environment for digital innovation and knowledge exchange*" among enterprises, which is exactly what Vietnamese SMEs need to thrive in the digital era.

5. Practical Frameworks and Strategies for Implementation

While supportive policies and theoretical insights provide a roadmap, the success of digital transformation ultimately hinges on implementation at the enterprise level. SMEs need clear, actionable strategies to navigate the complex process of going digital. This section proposes a practical framework for SME managers and owners in Vietnam to plan and execute digital transformation, drawing on best practices from literature and real-world experiences. The recommended approach is structured in sequential steps and critical focus areas:

5.1 Assess Readiness and Set Vision

An SME should begin with a candid assessment of its current state and digital readiness. This involves evaluating internal capabilities (e.g., existing IT systems, staff digital skills) and external conditions (market trends, competitor digital adoption). Tools like a *digital maturity assessment* or SWOT analysis can be useful. For instance, identify which business processes are most in need of improvement or which could benefit the most from digitalization (is it marketing, operations, customer service, etc.). At the same time, the leadership should formulate a clear vision of what they aim to achieve through digital transformation – whether it's reaching new customers, improving efficiency, developing new products, or a combination of these. Setting a vision ensures that the transformation efforts have direction and are aligned with business goals.

5.2 Secure Leadership Commitment and Cultivate Mindset

Top management's commitment is the cornerstone of successful transformation. SME owners and managers must not only approve of digital initiatives but champion them. As noted earlier, a "sufficient and correct awareness of leaders" is the "*decisive start*" for digital transformation. Leaders should educate themselves (through workshops, reading, or consulting with experts) about digital opportunities relevant to their industry. They also need to communicate to employees why digital transformation is critical for the company's future, thus creating a sense of urgency and buy-in. Given that many Vietnamese SME leaders have traditionally been cautious, shifting to a growth mindset that embraces technology is crucial. This might involve small cultural changes like encouraging experimentation, acknowledging that some failures will happen and are learning opportunities. For example, company meetings can regularly include discussions on how to improve processes or services using technology, signalling to staff that new ideas are welcome.

5.3 Develop a Digital Transformation Strategy and Roadmap

With vision and commitment in place, the SME should craft a tailored strategy. This strategy should identify priority areas for digitalization, the technologies or solutions to be adopted, required resources, and a timeline. It's often wise to **start small** with pilot projects or incremental changes rather than attempting a massive overhaul in one go (to avoid the misconception that "digital transformation deploys as much as possible, as fast as possible"). For example, the roadmap might plan in Phase 1 to implement a cloud-based accounting software and create a basic online presence; Phase 2 might introduce an e-commerce sales channel or CRM system; Phase 3 could explore data analytics or advanced automation. Each phase should have clear objectives (KPIs) such as "reduce order processing time by 50%" or "increase online sales by 20%". The plan should also include budgeting – allocate funds to each initiative and consider how to finance them (internal funds, loans, or applying for government support programs if available). At this stage, referencing a Digital Transformation Framework for SMEs can be helpful. Such frameworks (often provided

by consultants or institutions) outline typical components like strategy, technology, operations, and people. Adapting a known framework to the company's context ensures all key aspects are covered. For instance, one recommended model is to build and integrate an ecosystem of digital solutions, and to prioritize "centralized and shared application platforms" that can scale with the business. In practice, this could mean choosing software that can handle multiple functions or choosing systems that can easily integrate with each other (for scalability and efficiency).

5.4 Invest in the Right Technology Infrastructure

Based on the strategy, SMEs should carefully select technologies that fit their needs and scale. This might involve: upgrading hardware (computers, networking equipment) if current ones are too old; subscribing to software-as-a-service (SaaS) platforms for things like ERP, CRM, or inventory management; building a professional website or e-commerce store; and ensuring reliable internet connectivity. Given cost constraints, SMEs should consider **cloud-based solutions** which often have lower upfront costs and offer flexibility. For example, using cloud storage and online collaboration tools (like Google Workspace or Microsoft 365) can immediately improve productivity without heavy investment in servers. Many digital solutions now come in affordable packages aimed at SMEs. It is also strategic to ensure any new technology is **compatible** with existing processes (or that processes are adjusted to leverage the tech). SMEs might benefit from consulting with an IT expert or a service provider to get recommendations tailored to their business. Remember that "technology infrastructure" was identified as one of the key factors affecting digital transformation – having a robust and appropriate IT backbone will support all subsequent digital initiatives.

5.5 Focus on Skill Development and Change Management

Technology alone does not yield transformation; people do. SMEs must concurrently build the skills of their workforce. This can be done by organizing training sessions (perhaps facilitated by external trainers or through online courses) for any new tools introduced. For instance, if a new sales software is implemented, all sales staff should be trained to use it effectively. Beyond tool-specific skills, general digital literacy and even more advanced skills (like data analysis or digital marketing) should be cultivated in key employees. Companies could designate "digital champions" – staff who are tech-savvy and can help others troubleshoot and learn, fostering peer-to-peer support. In Vietnam, there are emerging programs by associations that provide digital skills training for SMEs; tapping into those would be useful. On the **change management** front, it's important to address employee concerns and resistance. SMEs should involve employees in the transformation journey, solicit their feedback on pain points that technology could solve, and gradually build a culture that is comfortable with change. Recognizing and rewarding teams or individuals who contribute to digital initiatives can reinforce positive attitudes. As recommended in the literature, "*promote the training of digital transformation human resources...and develop corporate culture*", since culture is "*considered the key to success in the digital age*". A culture aligned with digital transformation empowers employees, encourages faster decision-making, and attracts talent who are excited to

work in a forward-looking firm.

5.6 Leverage External Resources and Partnerships

SMEs should remember they do not have to go it alone. Many third-party resources can accelerate their digital transformation. For example, utilizing third-party digital platforms (an approach some researchers suggest as a quick win for SMEs) – instead of building an in-house e-commerce site, an SME can join existing e-commerce marketplaces (like Lazada, Shopee, or Tiki in Vietnam) to start selling online quickly. Similarly, SMEs can use social media (Facebook, Zalo) for marketing before investing in expensive marketing software. These platforms often come with analytics and tools that SMEs can use with minimal setup. Partnerships are also valuable: collaborating with IT service providers or startups can provide custom solutions. Universities or tech hubs in Vietnam sometimes run programs connecting students or tech companies with SMEs to solve business problems digitally; participating in such programs can yield low-cost innovative solutions. Another avenue is to join industry associations or local SME clubs where experiences on digitalization are shared – peers can recommend what worked for them and warn of pitfalls. Government-sponsored consultation (if available) should be sought – many local Departments of Industry and Trade or SME support centers now offer advisory services on digital transformation. In short, tapping into the ecosystem can greatly ease the transformation process for a resource-constrained SME.

5.7 Implement Incrementally and Monitor Progress

With plans, skills, and tools in place, actual implementation should be done in manageable phases. It's prudent to pilot new systems on a small scale, monitor results, and then roll out more broadly. For example, if adopting a new inventory management system, test it on a subset of products first. Monitoring is essential – define metrics for success (e.g., increase in sales leads after digital marketing, reduction in production downtime after IoT sensors) and track them regularly. If goals are not being met, investigate whether it's an issue of user adoption (do employees need more training?), technical issues, or unrealistic targets. Agile adaptation is key: the company should be willing to tweak its approach. Perhaps a chosen software doesn't perform as expected – it may need to be replaced, or additional features purchased. Transformation is iterative; SMEs should continuously refine their digital tools and processes. Importantly, celebrate quick wins and milestones to maintain momentum and buy-in. For instance, if online sales doubled after an e-commerce initiative, share that success internally (and even externally as marketing).

5.8 Ensure Data Security and Backup

One often overlooked aspect among SMEs is cybersecurity and data protection. As firms digitalize, they must also protect their digital assets. SME managers should establish basic cybersecurity practices: use licensed software, keep systems updated with patches, implement strong passwords and perhaps two-factor authentication, train employees not to fall for phishing emails, and regularly back up critical data (preferably in a secure offsite or cloud location). Given that many SMEs worry about data leakage, proactively addressing this not only prevents disasters but also builds confidence in the digital systems. If needed, consult

cybersecurity services for an assessment. The cost of basic cybersecurity is an essential part of the digital transformation budget.

5.9 Align Digital Transformation with Sustainable Growth

As SMEs implement digital changes, they should align these with their broader business strategy and sustainable growth. Digital transformation is not an end in itself; it should drive tangible business outcomes like higher customer satisfaction, new revenue streams, or improved profit margins. SMEs should continuously ask: how is this technology helping my business compete and grow? This ensures that technology adoption remains strategic and value-driven rather than just for the sake of being “modern.” Additionally, consider the “digital and green” twin transition trend— sometimes digital solutions can also contribute to sustainability (e.g., going paperless or optimizing energy use with smart systems). Vietnamese SMEs exporting or partnering with international firms might find that digital transformation also helps meet sustainability and compliance standards, adding another incentive.

By following these steps and strategies, SMEs can systematically approach digital transformation. It transforms what can be an overwhelming concept into a sequence of actionable tasks and principles. The key is to remain adaptive: the framework is not rigid. Some SMEs might do these steps in a different order or revisit earlier steps as they learn more. The overarching strategy is to be *strategic, people-centric, and incremental* in execution, which reduces risk and builds a strong foundation for deeper transformation. Crucially, this practical framework addresses the common pitfalls identified earlier: it starts with leadership mindset (to counter lack of awareness), includes budgeting (to address financial planning), emphasizes training (to tackle skill gaps), encourages using external help (so SMEs not knowing how to start or whom to partner with have guidance), and stresses culture (to overcome resistance). These align well with the solutions proposed by Vietnamese experts who note that success requires effort both from the government side and from the SMEs themselves to “*quickly raise awareness, transform thinking... and build a culture aligned with digital transformation.*”

6. Challenges Faced by Vietnamese SMEs in Digital Transformation

Despite the various strategies and supportive measures available, Vietnamese SMEs continue to face a multitude of challenges in their digital transformation journey. Understanding these challenges in depth is crucial, as it allows policymakers, support institutions, and the SMEs themselves to target the root causes and develop mitigation plans. Below is an overview of the major challenges, grounded in the findings from literature and surveys:

- **Limited Financial Resources:** Financial constraint is consistently cited as the top challenge. Implementing digital transformation can entail significant costs (purchase of software/hardware, hiring tech specialists, training staff, etc.). A majority of SMEs operate on tight budgets and find it hard to allocate funds for digital projects. As noted, 20% of surveyed firms had no dedicated budget for digital transformation, and another 43% had budgets that fell short of needs. High upfront

costs for modern equipment or enterprise software are perceived as prohibitive – in one study, 55.6% of SMEs pointed to the high cost of digital technology as a major barrier. This financial hurdle means that many SMEs delay or scale down their digital plans. It can also result in partial implementations (using free or pirated software, or relying on outdated tech) which may not yield desired benefits and could pose security risks. Without external funding support or affordable solutions, the financial issue remains a tough nut to crack for SMEs in Vietnam.

- **Digital Skills Gap and Human Resources:** Human capital is another critical weak link. Many SMEs lack employees (and often managers) with adequate digital skills. The fast pace of technological change has led to a shortage of IT professionals in the job market, and those available often command salaries that SMEs cannot afford. According to the Vietnam E-commerce Association, only about 30% of enterprises reported meeting their needs for skilled IT workers, meaning roughly 70% have difficulty hiring or retaining the talent required. Internally, existing staff might not have the necessary expertise – for example, an SME’s accountant may not know how to use a new cloud accounting system without training, or a marketing staff might not be adept at digital marketing tools. Training takes time and resources, which many SMEs underinvest in. This skills gap extends to leadership: if SME owners are not tech-savvy, they might not effectively champion or guide the transformation (and could even inadvertently resist it by sticking to familiar practices). Thus, the lack of a digitally skilled workforce and tech-aware leadership constrains the planning and execution of digital initiatives.
- **Inadequate Technology Infrastructure:** Many SMEs, especially smaller and micro businesses, do not have a solid technology foundation to build on. Some may not have reliable computers or internal networks; others might still be using very old software that isn’t compatible with new applications. The IT platform weakness is evidenced by 16.7% of SMEs citing lack of a strong IT platform as an impediment. Moreover, about 80-90% of machinery and technology used by Vietnamese firms is imported from past decades and considered outdated. This indicates that the basic tools SMEs work with might not support advanced digital solutions (for instance, an old computer might not run the latest software, or an old production machine might not have sensors to connect to IoT systems). Additionally, SMEs in rural or remote regions face issues with internet connectivity – if broadband is slow or unstable, cloud services and online operations become challenging. While Vietnam’s internet penetration is high in cities, last-mile connectivity and quality of service can be an issue in less developed areas. Without reliable electricity and internet, digital transformation efforts can literally be brought to a halt.
- **Lack of Strategic Planning and Awareness:** A soft but significant challenge is the lack of understanding, strategic planning, and correct mindset toward digital transformation among many SME owners. Surveys showed a portion of SME leaders do not fully grasp the benefits of digital transformation or see it as relevant to them. Many believe “*digital transformation is for large*

enterprises, not for SMEs". There's also evidence of four common misconceptions: that it's overly expensive, that it should be done in a single sweeping effort, that it will instantly solve all business problems, or conversely that it's unnecessary because the business is doing fine in traditional ways. Such misconceptions lead to either paralysis or misguided efforts. For example, an SME might invest in an off-the-shelf software expecting a magic solution without making complementary organizational changes, and then conclude "digital transformation doesn't work for us." Or an SME might do nothing, assuming their scale doesn't justify digital investment, only to be blindsided later by more tech-enabled competitors. A related issue is lack of information on where to begin and whom to trust. With 69% of SMEs unsure about choosing a technology partner and 72% not knowing how to start, many simply never start at all, or start very late. This points to an awareness and guidance vacuum that leaves SMEs feeling overwhelmed.

- **Resistance to Change and Cultural Barriers:** Implementing new technologies often changes how employees work. This can meet with resistance, especially if not well managed. Employees might fear that automation or new software could render their skills obsolete or increase their workload. In Vietnam's SME context, where many businesses are family-run or have informal cultures, introducing more structured digital processes can upset the familiar way of doing things. The case of employees not supporting the owner's push for digitalization, as reported in some firms, is a prime example. If staff "do not understand or have not changed their minds," they may either passively resist (by not using the new system properly) or actively push back. Such internal resistance can derail projects. Additionally, many SMEs have yet to cultivate a "digital culture" – one that encourages innovation, agility, and continuous learning. Instead, the culture may value sticking to what has worked in the past, which is antithetical to transformation. Changing this culture is challenging and takes time; it's an often invisible barrier that underlies the skill and awareness issues.
- **Cybersecurity and Privacy Concerns:** With greater use of digital tools comes exposure to cyber threats. SMEs often do not have robust security measures, making them vulnerable to attacks like malware, ransomware, or data breaches. This vulnerability creates fear about 33.9% of SMEs explicitly cited fear of data leaks and information security as a barrier to digital transformation. There have been cases of Vietnamese businesses experiencing cyber incidents, which heightens wariness. Since SMEs typically lack dedicated IT security staff, even the thought of dealing with cyber threats can be intimidating. This fear can cause delays (e.g., reluctance to move data to the cloud or to online systems due to security worries). Furthermore, any actual incident can be a major setback, both financially and in terms of trust in digital systems. So the challenge is twofold: improving security practices in SMEs and overcoming the psychological barrier where fear of potential risks outweighs perceived benefits.
- **External Environment and Market Challenges:** The

business environment in Vietnam, while dynamic, presents some external challenges. One is the competitive pressure from both domestic and international players – some SMEs may feel they cannot catch up with larger firms or foreign firms that are digitally advanced, leading to a defeatist attitude. Conversely, those that do face pressure might attempt digital changes under duress rather than strategic readiness, which can result in poorly executed projects. Another challenge is that many SMEs operate in low value-added segments with thin margins, so they are constantly balancing immediate survival with long-term improvements. The urgency of daily operations often leaves little bandwidth to focus on transformation projects that don't yield instant revenue. Additionally, Vietnam's informal business structure (many businesses are unregistered or operate semi-formally) means such SMEs don't access formal support and might not even be reached by awareness campaigns. They are in a sense "off the grid" in terms of receiving guidance on digitalization, which is a challenge for inclusive progress.

- **Startup Ecosystem and Innovation Support:** While perhaps less direct for existing SMEs, the broader innovation ecosystem challenge does affect them. Vietnam's startup and innovation ecosystem, as indicated by the ADB index where Vietnam ranked 63rd for digital startup environment, is still developing. This matters to SMEs because a vibrant ecosystem would mean more readily available innovative solutions tailored to local needs, more partnerships, and more talent. For example, if there were more local SaaS providers building affordable software for Vietnamese SMEs, or more local consultants, the barriers of cost and trust could be reduced. The fact that some Vietnamese startups themselves prefer to register in places like Singapore for better support suggests domestic support structures for innovation can improve. This is an indirect challenge: until the ecosystem matures, SMEs may have fewer home-grown options and examples to learn from.

In highlighting these challenges, it becomes evident that digital transformation for SMEs is not just a technical endeavor but a multifaceted change management challenge. Vietnamese SMEs are contending with resource limitations, knowledge gaps, human factors, and external constraints all at once. That said, awareness of these specific pain points is the first step to addressing them. For each challenge, targeted measures can be conceived – e.g., financial subsidies for the cost issue, vocational programs for the skills issue, leadership training for the mindset issue, awareness campaigns to counter misconceptions, improved cybersecurity support to alleviate security fears, and policy reforms to widen support to informal businesses. Indeed, the Vietnamese government and associations have begun to acknowledge these difficulties: the 2022 SME Digital Transformation report and other policy documents explicitly identify many of the above issues as areas to work on. By systematically tackling each challenge, Vietnam can help its SMEs gradually overcome the digital divide. The next and final section will conclude the discussion, tying together how the literature review, theoretical insights, policy considerations, practical strategies, and understanding of challenges all form a coherent picture of SME digital

transformation in Vietnam.

7. Conclusion

Digital transformation stands as a double-edged sword for Vietnam's small and medium enterprises – on one side, it offers unprecedented opportunities for growth, innovation, and competitiveness, while on the other, it presents considerable challenges and disruption to traditional ways of doing business. This article has provided a comprehensive examination of how Vietnamese SMEs are navigating this complex landscape, blending insights from international research with the Vietnamese context to draw a nuanced picture suitable for academic and policy consideration.

Summary of Key Findings: We began by recognizing the pivotal role of SMEs in Vietnam's economy and the government's strategic push towards a digital future. The literature review showed that globally, SMEs gain resilience and efficiency through digitalization, yet universally struggle with resource and capability constraints. In Vietnam, these struggles are pronounced: a majority of SMEs remain at early stages of digital adoption, with many not moving beyond basic digitization. Empirical studies in Vietnam indicate that while awareness of digital transformation's importance is growing, actual implementation is hampered by factors like limited finance, skills gaps, outdated technology, and misconceptions about digitalization. Notably, local research underscores the role of managerial intention and mindset – a finding aligning with theories like TPB – as a critical driver for whether SMEs embark on transformation.

From a theoretical standpoint, we integrated frameworks (TOE, DOI, TAM/TPB, RBV/dynamic capabilities) to understand SME digital transformation as a holistic phenomenon influenced by technological opportunities, organizational readiness, and environmental support. This theoretical lens reinforced that a successful transformation is not just about acquiring technology, but about aligning technology with organizational capacity and external facilitation.

Policy and Practical Implications: Our discussion on policy implications acknowledged Vietnam's commendable efforts, including the national digital transformation program and specific SME support policies. Yet, it also highlighted the need for more fine-tuned measures: improving legal frameworks to reduce uncertainty, expanding financial and advisory support with less red tape, investing in infrastructure and skills development, and fostering public-private partnerships to create an SME-friendly digital ecosystem (sam-d.sioecd.org). The practical framework provided a step-by-step guide for SMEs – from leadership mindset and strategy formulation to technology adoption and culture change – which is actionable and directly addresses known barriers (for example, by starting with small projects to avoid overwhelm and by emphasizing training to bridge skill gaps). This serves as a blueprint that SMEs can adapt to their unique circumstances.

Original Contributions: This article contributes original academic value by synthesizing a wide range of sources, including recent Vietnamese-language publications and international studies, to ensure the analysis is up-to-date as of 2025 and context-specific. It moves beyond generic statements to incorporate concrete data (such as percentage of SMEs with budgets, specific survey results on barriers) that ground the discussion in evidence. The dual perspective

in the literature review – comparing international vs Vietnamese scholarship – provides a richer understanding of where Vietnam stands relative to global benchmarks. Furthermore, the theoretical framework is tailored to an SME context and integrates multiple theories, which can be a basis for future empirical research or hypothesis testing in Vietnam or similar emerging economies.

Challenges and the Road Ahead: We identified numerous challenges for Vietnamese SMEs – financial, human capital, infrastructural, cultural, and external. Recognizing these challenges is crucial for all stakeholders. For SMEs, acknowledging internal weaknesses is the first step to seeking help or making improvements. For the government and policymakers, these challenges delineate clear areas where intervention is needed, such as subsidizing digital investments or revamping training curricula to produce more digitally-capable graduates. For instance, bridging the digital skill gap might involve not just short-term workshops but integrating digital skills in vocational training and university programs to enlarge the talent pool over time.

One clear insight is that no single action will achieve SME digital transformation. It requires a coordinated approach: policy initiatives from top-down and proactive change from bottom-up within firms. Encouragingly, the alignment of interests is evident – the government's economic goals align with SMEs becoming more productive and innovative, and SMEs' survival and growth increasingly depend on how well they adopt technology. This alignment bodes well for collaborative efforts. Already, collaborations like the USAID LinkSME project or private sector initiatives to digitize supply chains show that when large corporations, government agencies, and SMEs work together, progress can happen faster.

Conclusion and Future Outlook: In conclusion, the digital transformation of SMEs in Vietnam is underway but still in an early, formative phase. This article's analysis suggests that Vietnam possesses the foundational elements (policy will, entrepreneurial SME base, growing tech infrastructure) to make substantial strides, but concerted efforts are required to overcome impediments. If Vietnam can effectively implement the recommended policy tweaks – simplifying access to support, investing heavily in SME-focused digital infrastructure and training, updating regulations – and if SMEs themselves adopt the strategic and incremental approach outlined, the country could witness a significant acceleration in SME digitalization over the next decade.

The implications of successfully digitized SMEs are far-reaching: increased competitiveness of local firms, higher contributions to GDP, better job creation (including high-skill jobs), and improved capacity to expand into international markets, thereby supporting Vietnam's broader goals of industrialization and moving up the value chain. Moreover, SME digital transformation contributes to social goals by enabling inclusive growth (e.g., rural SMEs accessing global customers) and by fostering innovation at the grassroots level.

Finally, future research could build on this work by empirically testing the proposed frameworks or by conducting longitudinal studies to track SME digital transformation outcomes in Vietnam. As technologies evolve (for instance, with AI and advanced analytics becoming more accessible), new opportunities and challenges will emerge. Continuous research and adaptation

of strategies will be necessary. But with strong fundamentals and commitment, Vietnam's SMEs can transform not only themselves but also drive the nation's transformation into a robust digital economy.

Overall, the journey of digital transformation for SMEs in Vietnam is a challenging yet attainable one – with the potential to unleash a new wave of productivity and innovation if navigated with insight, support, and determination. The intersection of academic insight and practical action, as presented in this article, aims to aid that navigation in the years to come.

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