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VIETNAM'S DIGITAL TRANSFORMATION PROCESS IN ASEAN: A COMPARATIVE ANALYSIS WITH SINGAPORE AND INDONESIA

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ABSTRACT

Digital transformation is a major driver of national economic development and, at the same time, raises the competitiveness and innovation of various sectors. This research study compares the digital transformation development in the three ASEAN countries of Vietnam, Singapore, and Indonesia by looking into governmental strategies, the level of private sector involvement, major driving factors, and barriers to implementation. The study recommends policy directions and preferred forms of intervention for Vietnam's digital transformation, while leveraging regional experience to develop a comprehensive and sustainable digital economy. The work has identified that only a well-integrated regulatory structure, targeted investment in digital infrastructure, and continuous human resource development could be the key conditions for developing countries to fully benefit from digital transformation.

Keywords: Digital Transformation, Human Resource Development, Data Governance, National Cybersecurity

1.0 INTRODUCTION

The global economic environment is undergoing significant transformations due to the widespread adoption of digital technology, thereby altering industrial frameworks, governance approaches, and modes of social interaction. Digital transformation (DT) is defined as a comprehensive process in which digital technologies are integrated across all functions of an organisation or economy, resulting in profound changes in operational methods and value creation (Gebayew et al., 2018; Verina & Titko, 2019). In the ASEAN region, this process is notably robust, as member states aggressively use technological breakthroughs to foster economic growth, enhance competitiveness, and reinforce regional integration.

In ASEAN, Vietnam, Singapore, and Indonesia exhibit remarkable rates of digital development; thus, a comparative analysis of digital transformation in these three nations holds substantial theoretical and practical significance. Due to its extensive measures for fostering digital connectivity and economic advancement, Singapore frequently emerges as a regional leader. Concurrently, Indonesia, a vast archipelagic nation, has experienced the rapid adoption of digital technologies, particularly amid global disruptions that emphasise the necessity of digital resilience. Vietnam, recognised as one of ASEAN's dynamic economies, is aggressively executing a digital transformation initiative while emphasising regional economic integration and collaboration (Zulianto, 2024).

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Systematically, analysing the methodologies, accomplishments, and obstacles encountered by these three nations will yield essential insights for formulating effective strategies to navigate the intricacies of digital transformation. This paper conducts a comparative analysis of Vietnam's digital transformation in relation to Singapore and Indonesia, emphasising critical elements such as the policy environment, technological infrastructure, human resource development, and the distinct opportunities and challenges in each national context. The comparison results are expected to yield valuable policy implications and empirical evidence for the strategic planning of Vietnam's digital transformation, thereby aiding the establishment of a sustainable, inclusive, and highly adaptive digital economy within the dynamic ASEAN framework.

2.0 LITERATURE REVIEW

Digital transformation refers to the application of digital technology and data to instigate significant changes across all facets of socio-economic life, hence redefining operational procedures and social interactions (Le et al., 2024). This process extends beyond the technological dimension to include managerial components at the strategic, tactical, operational, and institutional levels. A comprehensive approach to digital transformation frequently relies on theoretical frameworks that explain technological adoption patterns and organisational changes. The Technology-Organisation-Environment (TOE) framework is widely used to examine the determinants of technology adoption in enterprises by concurrently evaluating the technological context, organisational attributes, and external environmental influences (Van Huy et al., 2012; Ji & Li, 2022). This analytical paradigm effectively elucidates the multifaceted character of digital transformation, particularly for micro, small, and medium-sized enterprises (MSMEs), which frequently face resource constraints (Dörr et al., 2023).

Research on digital transformation in small and medium-sized enterprises (SMEs), a prevalent business model in ASEAN, generally categorises aspects into three primary groups: technology, organisation, and environment (Zhang et al., 2022). Technology aspects specifically encompass awareness of the utility, compatibility, and security prerequisites of digital solutions (Linh & Huyen, 2025). At the organisational level, critical determinants include leadership commitment and support, workforce IT competencies, and the availability of internal resources (Hoang & Nguyen, 2022; Hoang et al., 2021; Hai, 2021). Environmental elements encompass governmental support programmes, market competitive pressures, and the extent of assistance from external partners (Chau et al., 2020; Nguyen, 2024). This method facilitates the methodical identification of the facilitators and impediments to digital transformation for SMEs within the regional context.

In Singapore, the digital transformation process is predominantly influenced by the State's robust leadership through policies that advocate for the digitisation of the public sector and stimulate the utilisation of information technology in the commercial sector. These initiatives encompass systematic investment in human resource development and digital infrastructure, alongside a purposeful transition to e-commerce-orientated company models, in accordance with overarching economic growth objectives. Simultaneously, Indonesia's digital transformation is marked by rapid dissemination, with an emphasis on policy initiatives to advance digital transformation in the small and medium-sized enterprise sector (Alyani et al., 2023; Purnomo et al., 2024). Nonetheless, the nation continues to face substantial obstacles,

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including data security concerns, constraints on the advancement of digital infrastructure, and limited human resource preparedness, especially in rural regions (Gusman, 2024; Dudhat & Agarwal, 2023).

Initiatives to advance digital transformation in Vietnam are expanding in both breadth and intensity, with a focus on integrating digital technologies into essential sectors such as commerce, tourism, business, banking, and education (Le et al., 2024). The government has implemented numerous measures to advance research and technology and to assist small and medium-sized enterprises (SMEs) in their transformation (Chuc et al., 2023). Nonetheless, enterprises in Vietnam continue to encounter substantial obstacles, including constraints in technical proficiency, financial resources, and the regulatory environment. Particular obstacles include elevated transformation costs, inconsistent internal technological infrastructure, risks of data leakage, and the inefficacy of certain prevailing legislation (Chuc et al., 2023). Research on small and medium-sized enterprises in Vietnam indicates that IT capabilities, human resource quality, and strategic orientation positively influence the digital transformation process; however, they may also provide obstacles if inadequately developed (Hai, 2021). The digital economy in Southeast Asia is experiencing robust regional growth, underscoring opportunities for collaboration and shared challenges, especially in addressing the digital divide among nations (Putri et al., 2023).

3.0 METHODOLOGY

This comparative analysis employs a qualitative, descriptive technique, based on an extensive review of relevant academic literature, policy papers, and research reports regarding digital transformation in Vietnam, Singapore, and Indonesia. The method entails integrating diverse findings to develop a nuanced view of each country's digital progress. The data collection aimed to identify government strategies, principal drivers, existing barriers, and the effects of digitisation across economic sectors.

The preliminary stage entailed a methodical literature review of academic publications and studies from 2010 to 2024, focusing on digital transformation, the digital economy, and technology adoption across the three chosen countries and the wider ASEAN context. Search criteria encompassed “digital transformation”, “digital economy”, “e-commerce adoption”, “SMEs”, “government policy”, and specific nations: “Vietnam”, “Singapore”, and “Indonesia”. Emphasis was placed on research utilising empirical methodologies, including surveys, case studies, and econometric models, that yielded particular insights into the determinants of digital transformation.

Following data compilation, a thematic analysis was performed. This entailed recognising persistent themes across legislative frameworks, infrastructure development, human capital, private-sector involvement (especially SMEs), and socioeconomic outcomes. The selected themes were further classified to enable cross-country comparison. Themes concerning governmental support were analysed for their characteristics and effectiveness in each nation. Likewise, issues, including digital literacy, cybersecurity, and infrastructural deficiencies, were documented and analysed.

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The comparison phase entailed contrasting the identified themes and findings among Vietnam, Singapore, and Indonesia. This enabled the identification of similarities and differences in their digital transformation strategies. For instance, whereas all three countries prioritised SME digitalisation, the specific assistance systems and the kinds of impediments encountered differed. This comparative framework facilitates the extraction of optimal practices and the identification of areas where one nation's experience may benefit others. The methodology emphasises analytical depth rather than quantitative modelling, seeking to offer a comprehensive, contextual knowledge of intricate digital developments within a regional context.

4.0 RESULTS AND DISCUSSION

A comparative review of digital transformation in Vietnam, Singapore, and Indonesia highlights varying tactics, levels of advancement, and challenges across the ASEAN region. Every nation demonstrates distinct attributes in its endeavours to establish a resilient digital economy.

4.1 Vietnam's Context

Recently, Vietnam has made substantial advancements in its digital transformation, as demonstrated by improvements in institutions, infrastructure, and digital economic development. The Government has promulgated the National Digital Transformation Program to 2025, with a vision extending to 2030 (Decision No. 749/QD-TTg), which has three fundamental pillars: digital government, digital economy, and digital society. This framework has established a basis for the coordinated execution of digitisation projects across the nation while also encouraging the involvement of both the public and commercial sectors in the transformation process (Le et al., 2024).

Vietnam has achieved notable advancements in infrastructure through the expansion of broadband networks, the widespread adoption of the Internet, and the incremental rollout of 5G technology, thereby improving connectivity and facilitating the advancement of emerging technologies such as artificial intelligence (AI), big data, and the Internet of Things (IoT). Enhancements in digital infrastructure have reduced disparities in technology access across regions and created conducive conditions for the advancement of the digital economy (Nguyen, 2024).

Vietnam has experienced significant growth in the digital economy within Southeast Asia, particularly in e-commerce, digital payments, and platform services. Businesses, particularly small and medium-sized enterprises (SMEs), are increasingly adopting digital technologies in their production and operational activities, enhancing productivity and competitiveness (Hai, 2021). The innovation and startup environment within the digital technology sector is concurrently evolving rapidly, generating numerous new business models and facilitating technology transfer.

These endeavours result in improved global rankings. Vietnam has improved its rankings in the E-Government Development Index (EGDI), the Global Innovation Index (GII), and the Global Cybersecurity Index (GCI), indicating advancements in digital governance, innovation, and cybersecurity (Minh Hoang, 2025). These accomplishments demonstrate that Vietnam is

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progressively building a robust foundation to advance the digital economy and digital society while reinforcing its increasingly significant role in the ASEAN region's digital transformation landscape.

4.2 Vietnam's Digital Trajectory

Vietnam is increasingly establishing itself as a significant player in ASEAN's digital economy by implementing government programmes to enhance digital integration and cross-regional collaboration (Zulianto, 2024). The national digital transformation initiative aims to include digital technology throughout essential sectors, including commerce, tourism, manufacturing, business, banking, and education (Le et al., 2024). Policies and programmes established by the Ministry of Education and Training unequivocally indicate a commitment to advancing digitalisation across the entire education sector (Le et al., 2024).

Nonetheless, despite these initiatives, Vietnamese enterprises continue to encounter numerous obstacles to implementing digital technology. The primary restrictions include inadequate technical capacity, limited financial resources, and the complexity of the legal structure. The specific issues include elevated conversion costs, inadequate internal technological infrastructure, data security hazards, and restricted administrative efficiency (Chuc et al., 2023). Survey findings for small and medium-sized enterprises (SMEs) in Vietnam indicate that while factors such as information technology capability, human resource quality, and strategic orientation positively influence digital transformation, inadequate development of these factors can also pose substantial obstacles (Hai, 2021).

A deficiency in proficient human resources and constrained information technology skills has been recognised as a major impediment to the digital transformation process (Hai, 2021; Comin et al., 2021). Government assistance programmes have positively influenced the innovation capacity and IT adoption capabilities of small and medium-sized enterprises (SMEs) (Mai et al., 2023). Nonetheless, a considerable disparity persists in firms' understanding of state-sponsored technology enhancement projects and policies (Comin et al., 2021). Despite the growing acknowledgement of the digital economy in Vietnam as an unavoidable developmental trajectory, propelled by governmental initiatives and action plans, this sector still requires in-depth investigation and extensive research to thoroughly evaluate its benefits and potential repercussions.

Digital transformation has positively influenced the operational efficiency of small and medium-sized enterprises (SMEs) in Vietnam, with digital innovation serving as a vital mediator in translating technological advantages into business outcomes (Sang, 2023). Research indicates that perceived compatibility, leadership support, and external environmental pressure are critical elements influencing the decision to implement e-commerce in the SME sector (Hoang & Nguyen, 2022; Hoang et al., 2021). Moreover, the implementation of mobile commerce is influenced by various factors, including anticipated benefits, compatibility, security requirements, organisational preparedness, innovation potential, customer impacts, governmental support, and the IT proficiency of the management team (Chau et al., 2020).

4.3 Singapore's Advanced Digital Economy

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The government has predominantly driven Singapore's digital revolution, marked by a strong public policy framework and effective execution. The preliminary stage focused on digitising the public sector, thereby generating a ripple effect in the commercial sector. Subsequent strategies have vigorously advocated the utilisation of information technology (IT) and the advancement of associated industries through strategic investment in human capital and digital infrastructure. The rise in internet penetration has augmented these policies to facilitate e-commerce, intricately linking them to comprehensive economic growth objectives.

The fundamental components of Singapore's success comprise efficient collaboration among governmental bodies, substantial alliances with international firms, data-driven policymaking, significant governmental agility, and the capacity to exploit the benefits of a tiny nation. Nonetheless, despite its accomplishments, Singapore continues to face certain problems, notably a shortage of skilled labour and limited adoption of information technology in the small and medium-sized enterprise (SME) sector. In the energy and chemical sectors, the implementation of digital twin models encounters several barriers, including resource limitations, data governance issues, technological difficulties, and strategic impediments (Zhan et al., 2024). These obstacles are frequently linked to substantial investment costs and a scarcity of successful implementation examples, thereby diminishing the capacity to demonstrate the efficacy of investments (Zhan et al., 2024).

4.4 Indonesia's Dynamic Digital Landscape

Indonesia has had a swift digital transition, becoming one of the leading nations in this domain, even exceeding Brazil and China in several metrics. The Indonesian government has established lofty objectives for digital transformation, specifically targeting the micro, small, and medium-sized firm (MSME) sector (Alyani et al., 2023). The advancement of the digital economy has substantially increased gross domestic product (GDP) while improving productivity and stimulating production, consumption, and distribution activities within the economy (Dudhat & Agarwal, 2023). E-commerce, in conjunction with advances in financial technology (fintech), has significantly contributed to the expansion of Indonesia's digital economy (Tanjung et al., 2023).

The digital transformation process in Indonesia continues to encounter numerous substantial hurdles. The digital gap persists significantly due to the geographical features of the extensive archipelago, which restricts internet access in numerous regions. Moreover, concerns regarding data security, cyberattacks, transaction fraud, and deficiencies in digital infrastructure across numerous regions pose ongoing threats to national security and digital advancement (Dudhat & Agarwal, 2023; Gusman, 2024). Moreover, the workforce's preparedness to adopt and utilise new technology constitutes a substantial barrier (Gusman, 2024). For micro, small, and medium-sized enterprises (MSMEs), factors such as perceived utility, security requirements, employees' IT competencies, and the extent of government assistance substantially influence the decision to adopt e-commerce. Government assistance, a focus on digital transformation, and firms' digital capabilities positively influence MSMEs' digital transformation, thereby enhancing financial performance (Alyani et al., 2023).

5.0 COMPARISON AND OVERVIEW

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A comparative analysis delineates notable distinctions and shared features in the digital transformation processes of the three nations:

5.1 The Role of Government and the Maturity of Policies

Singapore represents a sophisticated and cohesive model of state-driven digital transformation, characterised by policies aligned with a coherent roadmap encompassing public-sector digitisation, innovation promotion, and broad economic advancement. The Singaporean government assumes an institutional role and actively orchestrates the digital ecosystem through intersectoral coordination mechanisms, strategic investments in infrastructure and human resources, and the implementation of evidence- and data-driven policy-planning methodologies. This guarantees significant flexibility and agility in response to swift technology advancements.

The Indonesian government has actively facilitated digital transformation, especially through initiatives that promote micro, small, and medium-sized enterprises (MSMEs) and enhance access to digital technologies. The efficacy of policy implementation is influenced by structural obstacles, such as extensive geographic scale, population dispersion, and varying levels of development across regions (Alyani et al., 2023). These characteristics necessitate highly adaptable policies tailored to local situations, thereby increasing the complexity of administration and execution.

The Vietnamese government is deepening its efforts to promote digital transformation by implementing national strategies, action plans, and laws to support businesses. Nonetheless, the development of these policies is ongoing, as enterprises continue to report constraints regarding uniformity, implementation effectiveness, and the clarity of the legal framework (Chuc et al., 2023). Moreover, collaboration among regulatory bodies and the capacity to translate policies into tangible actions at the local level require enhancement to increase the overall efficacy of the digital transformation process.

5.2 Infrastructure and Accessibility

Singapore’s sophisticated and cohesive digital infrastructure is characterised by extensive internet coverage, high connection speeds, and exceptional reliability, which creates a conducive environment for implementing digital technologies in both the public and private sectors. The nation prioritises developing national data platforms, cloud computing, and a coherent digital ecosystem, thereby improving governance, efficiency, and innovation capabilities. Conversely, Indonesia experiences a pronounced digital gap, largely attributable to its extensive archipelagic terrain, resulting in a considerable disparity in access to digital infrastructure between urban and rural regions, as well as between developed and underdeveloped islands. Despite the government's implementation of several projects to enhance telecommunications and internet infrastructure, constraints related to investment costs, geographical conditions, and deployment capacity persist as significant obstacles to achieving nationwide digital connectivity.

In Vietnam, digital infrastructure has improved considerably recently, especially in urban centers; however, challenges persist regarding synchronisation, connectivity quality, and accessibility in rural and remote regions. The restrictions are particularly evident in small and

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medium-sized enterprises (SMEs), where constrained financial resources and limited technological investment diminish their capacity to access and efficiently utilise digital platforms (Hai, 2021). The absence of supportive infrastructure, including data centres, exchange platforms, and cost-effective digital services, further exacerbates the digital gap among business groups and economic sectors.

5.3 Human Resource Development

All three nations recognise the essential role of high-quality human resources in facilitating and maintaining digital change. Singapore distinguishes itself by a methodical, long-term strategy for skills development that encompasses ongoing training initiatives, digital skill reskilling and upskilling, and a strong connection between the school system and labour market requirements. The government aggressively partners with the commercial sector and international technology firms to develop a workforce adept at swiftly adjusting to evolving technologies.

Simultaneously, Vietnam and Indonesia continue to face numerous hurdles in developing human capital for digital transformation. Key challenges include deficiencies in digital competencies, a shortage of highly trained professionals in technology sectors, and a disconnect between training programmes and the practical requirements of enterprises (Chuc et al., 2023; Le et al., 2024; Gusman, 2024). The workforce's preparedness to embrace and use new technology is inconsistent, especially in suburban regions and among small and medium-sized enterprises (SMEs).

Moreover, deficiencies in the managerial competencies and digital acumen of corporate executives substantially affect the efficacy of digital transformation execution. This signifies that, beyond mere technical skills training, there is a need to cultivate digital management competencies, innovative thinking, and adaptability within a digital company landscape. Consequently, establishing a holistic human resource development strategy that integrates formal education, vocational training, and lifelong learning is essential for improving the digital competitiveness of Vietnam and Indonesia in both regional and global arenas.

5.4 Focusing on Small and Medium-Sized Enterprises (SMEs/MSMEs)

Digital transformation in the SME sector is a shared policy objective across all three nations, underscoring the sector's vital contribution to economic growth and job creation. In Indonesia, government backing, a strategic focus on digitisation, and inherent digital skills are recognised as primary catalysts for the digital transformation of micro, small, and medium-sized enterprises (MSMEs) (Alyani et al., 2023). The Indonesian government has initiated various programs to provide access to digital platforms, digital finance, and e-commerce in this sector, fostering greater participation in the digital economy.

In Vietnam, despite increased government assistance, small and medium-sized enterprises (SMEs) continue to face numerous challenges in digital transformation. The primary hurdles are constrained financial and technological resources, insufficient IT expertise and skills, and a misalignment between corporate strategy and digitalisation objectives (Hai, 2021). Moreover, access to appropriate technological solutions and implementation expenses constitute considerable obstacles, particularly for small enterprises.

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In Singapore, small and medium-sized enterprises (SMEs) operate within a robust digital ecosystem, bolstered by sophisticated infrastructure, supportive legislation, and an extensive network of collaborators. A capacity disparity remains between SMEs and large firms, as demonstrated by their comparatively slower rate and extent of IT adoption. The primary factors are resource constraints, organisational preparedness, and prudent investments in new technologies.

Despite varying settings and developmental stages, SMEs in all three nations are pivotal to the digital transformation process yet remain susceptible to resource, capability, and institutional constraints. Consequently, formulating targeted support policies tailored to the distinct attributes of each business group is critical to promoting a thorough and effective digital transformation.

5.5 Cybersecurity and Data Governance

The rapid advancement of Indonesia's digital economy has heightened cybersecurity threats, including data exploitation, digital fraud, and coordinated cyberattacks (Dudhat & Agarwal, 2023). Inconsistent digital infrastructure and an evolving data governance framework amplify these issues. In Vietnam, data leakage and security concerns are increasingly acknowledged as substantial threats for both enterprises and regulatory authorities, particularly as digitisation accelerates and data protection measures remain inadequate.

Simultaneously, Singapore, with a sophisticated digital infrastructure, has established and continually refined its regulatory framework for cybersecurity and data governance to accommodate the rapid evolution of technology. The nation prioritises establishing rigorous standards for personal data protection, information security, and risk management, while fostering public-private collaboration to enhance cybersecurity. ASEAN nations are striving to achieve better coordination and to establish a unified cooperation framework to address cross-border cyber risks and improve data governance capabilities at the regional level (Zulianto, 2024).

The variations in approach indicate the developmental stage and institutional capabilities of each nation. Singapore distinguishes itself through a robust, government-led digital transformation framework, underpinned by advanced infrastructure and a meticulously organised human resources development strategy, thereby preserving its preeminent status in the field. Indonesia's swift adoption of technology, particularly among consumers and small and medium-sized enterprises (SMEs), illustrates the significant impact of market dynamics coupled with tailored assistance policies, despite ongoing geographical and infrastructural challenges. Vietnam, despite notable advancements in digital transformation, is at a critical juncture where enhancing internal capacity, refining the legal framework, and elevating the digital competencies of its workforce will be crucial for the pace, quality, and inclusivity of future digital economy development.

6.0 CONCLUSION

A comparative analysis of Vietnam's digital transformation process alongside Singapore and Indonesia highlights the convergence of shared developmental objectives and the distinct attributes of each nation. Singapore's situation illustrates the effectiveness of a proactive, highly

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integrated, and government-driven approach to digital transformation, which emphasises the establishment of a comprehensive regulatory framework, substantial investment in digital infrastructure, and ongoing human resources development. The success of this nation is bolstered by efficient collaboration among government entities, strong alliances with the corporate sector, and adaptable governance mechanisms that respond to rapid technological advancements.

Conversely, Indonesia's digital transformation path is notable for its swift adoption of technology, propelled by its substantial domestic market and the government's growing role in facilitating the digitisation of micro, small, and medium-sized enterprises (MSMEs). This process is hindered by structural constraints, notably disparities in geographical conditions and infrastructural development between areas, which impede the uniformity and sustainability of digital transformation. Vietnam's digital transformation, despite notable advancements, continues to face conventional hurdles characteristic of emerging countries, such as constrained technical and financial resources, a lack of digital skills, and an inadequate regulatory framework.

At the enterprise level, especially within the small and medium-sized enterprises (SME) sector, intrinsic elements such as IT capabilities, human resource quality, and strategic orientation are recognised as both facilitators and potential impediments to digital transformation when inadequately developed. Consequently, fortifying these intrinsic capabilities – such as investing in technological infrastructure, augmenting the digital competencies of the workforce, and formulating suitable transformation strategies – is deemed essential for advancing and expediting digital transformation within the Vietnamese enterprise sector.

7.0 RECOMMENDATIONS

Based on the comparisons above, several policy proposals have been suggested for Vietnam to facilitate digital transformation:

• Strengthening Digital Infrastructure

Investing in enhancing digital infrastructure, particularly high-speed internet with extensive coverage and robust stability, is a crucial prerequisite for digital transformation. The emphasis must be on enhancing connectivity in rural and remote regions to bridge the digital gap and ensure equitable access to technology. Insights from Indonesia indicate that emphasising the advancement of inter-regional connectivity infrastructure in a geographically complex environment can facilitate nationwide digital integration, thereby fostering greater involvement of economic entities in the digital economy.

• Enhancing Human Resource Development

Emphasis must be placed on implementing training and skills enhancement initiatives in digital competencies, particularly advanced information technology skills, for the workforce, including managers and employees in small and medium-sized enterprises (SMEs). Singapore's experience illustrates the effectiveness of ongoing, systematic investment in human resource development, which intricately combines training, the labour market, and business requirements. In the Vietnamese environment, educational and training activities must broaden

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in scope and depth while enhancing alignment with industry demands and emerging technological trends. Moreover, fostering lifelong learning, reskilling, and upskilling will be essential for improving the workforce's adaptability to the swift transformations in the digital landscape.

• Improving and Streamlining the Legal Framework

Establishing a coherent, uniform, and supportive legal framework is crucial for advancing the digital economy, encompassing aspects such as digital business operations, data governance, and cybersecurity. Particular emphasis must be placed on enhancing legislation concerning data protection and information security to mitigate risks, such as breaches, while simultaneously boosting compliance and transparency in the digital landscape. For Vietnam, rectifying policy execution deficiencies and abolishing redundant and ineffective laws will bolster the trust of firms and investors, ultimately fostering momentum for increased investment and innovation in the digital technology industry.

• Strengthening support for digital transformation in SMEs

Targeted support policies must be enacted, including financial incentives, technical guidance, and training programs tailored to the distinct characteristics of SMEs. These methods reduce financial barriers to transformation while increasing corporate awareness of available support programs. Evidence from Indonesia indicates that when support policies are tailored to the distinct requirements of the micro, small, and medium-sized enterprise (MSME) sector, they can substantially enhance both the adoption of digital technologies and the financial performance of businesses. Consequently, personalising assistance tools and improving access to policies are essential elements in fostering an effective and sustainable digital transformation within the SME sector.

• Promoting Public-Private Partnerships

It is essential to enhance and broaden collaborative frameworks among the public sector, technology firms, and research and educational institutions to foster innovation and address the distinct issues of each sector. These relationships enhance the exchange of resources, expertise, and technology while also promoting technological transfer and the establishment of a sustainable digital ecosystem. Singapore's experience demonstrates that establishing robust collaborative networks with global firms and research institutions can generate significant spillover effects, thereby augmenting the economy's innovation capacity and competitiveness amid the digital transition.

• Enhancing Cybersecurity and Digital Resilience

Investment in enhancing national cybersecurity capabilities should be prioritised, with awareness initiatives for enterprises and citizens to safeguard digital assets and bolster trust in the digital ecosystem. These approaches immediately mitigate the information security risks identified in Indonesia and align with prevalent concerns across the ASEAN region. Enhancing digital resilience mitigates risks and lays a robust foundation for efficiently harnessing the benefits of digital transformation to boost corporate productivity and economic growth. Insights from Singapore and Indonesia indicate that a holistic strategy is essential for efficiently

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addressing the challenges of digital transformation, encompassing the synergistic integration of appropriate legislation, advanced digital infrastructure, and skilled human resources. These are the fundamental prerequisites for advancing a sustainable, inclusive, and highly resilient digital economy within the ASEAN framework.

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