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Digital Economy Development in Vietnam: Challenges and Policy Directions

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Abstract

Vietnam's economy is undergoing a profound digital transformation driven by rapid ICT adoption, e-commerce expansion, and ambitious government initiatives. This study critically examines Vietnam's digital economy landscape, identifying infrastructure, regulatory, skills, and inclusion challenges. We review global and Vietnamese literature, describe a qualitative policy analysis framework, and compare Vietnam's experience with advanced digital economies (Singapore, South Korea, China, EU). Drawing on official data and reports, we outline policy directions (2025–2035) to overcome constraints. Key findings highlight Vietnam's fast-growing digital sector (reaching

~18% of GDP in 2024), but note hurdles in broadband reach, legal frameworks, workforce training, and rural access. International benchmarks underscore the importance of liberalized telecoms, robust digital regulation, and inclusive skill development. We recommend targeted policies on broadband expansion, regulatory clarity (data protection, competition), digital literacy, and public-private partnerships to achieve the government's goal of a 30% digital-economy share by 2030. This analysis provides evidence-based guidance for policymakers, aligning with Vietnam's National Digital Transformation Program and global best practices.

Keywords: Digital Economy, Vietnam, Digital Transformation, Infrastructure, Policy, Comparative Analysis, Digital Divide, Human Capital, Regulatory Framework

1. Introduction

The digital economy – broadly defined as economic activity enabled by digital technologies – has become a critical growth engine worldwide. In 2021, global digital value added reached \$38.1 trillion, about 45% of G20 GDP. Among G20 members, China's digital economy reached \$7.1 trillion (39.8% of GDP) in 2021, second only to the US (40%), while the EU's was \$6.3 trillion. These figures underscore the strategic importance of digitalization. Vietnam has responded with a National Digital Transformation Program to 2030, targeting a leading digital economy in ASEAN. Already, Vietnam's digital sector has grown rapidly: it accounted for roughly 12% of GDP by 2023 and rose to ~18.3% by 2024, with ICT industry revenues of about \$148 billion in 2022. Building on this momentum is vital for Vietnam's economic modernization and international competitiveness.

Despite strong growth, Vietnam faces significant challenges. This paper examines the current landscape and obstacles in Vietnam's digital economy — including gaps in broadband infrastructure, legal and regulatory shortcomings, shortages of digital skills, and urban-rural divides — and compares Vietnam's experience with Singapore, South Korea, China, and the EU. Using a qualitative policy analysis approach, we synthesize government reports, industry studies, and international benchmarks. We then propose evidence-based policy directions and recommendations (2025–2035) to accelerate Vietnam's digital economy. The objective is to inform scholars and policymakers by providing a comprehensive, data-driven assessment aligned with international best practices.

2. Literature Review

The digital economy is multifaceted, encompassing activities from e-commerce and digital payments to data services and high-tech manufacturing. World Bank analysts identify broadband connectivity, electronic payment systems, logistics, human capital, and regulatory frameworks as core pillars of digital development. In Vietnam, several studies and government assessments have highlighted similar drivers. For example, Vietnam's National Digital Transformation strategy emphasizes “Digital Government, Digital Economy, Digital Society,” aiming for 20–30% of GDP by 2025–2030 through ICT adoption across industries.

Connectivity and infrastructure are widely cited as enablers. The World Bank notes that Vietnam's Internet penetration soared from near zero in 2000 to 64% of the population by 2020, yet stresses that further expansion of 4G/5G mobile and fiber networks is crucial. Likewise, broadband access must reach rural and remote communities to promote inclusiveness. On the demand side, digital payment adoption is low in Vietnam: as of 2020 only 22% of adults had made or received digital payments, and just 41% held bank accounts. This gap constrains e-commerce and fintech growth.

Regulatory policy is another important theme in the literature. Vietnam has enacted key laws on cybersecurity (2019) and data protection (2023 draft Personal Data Protection Decree). However, scholars caution that heavy restrictions and lack of harmonization (e.g. data localization rules) may inadvertently discourage investment and cross-border trade. Over-regulation is also noted globally: for example, the EU's stringent digital laws (GDPR, Digital Markets and Services Acts) create compliance burdens especially for SMEs.

Human capital and digital skills are frequently mentioned as bottlenecks. The International Labour Organization warns that up to 56% of Vietnamese jobs could be affected by automation in the coming years, highlighting the need for advanced IT skills and lifelong learning programs. Reports emphasize shortages of qualified ICT professionals and educators in Vietnam. Similar concerns appear in policy reviews: for instance, the OECD recommends boosting vocational and tech education to build IT capabilities.

In sum, the literature underscores that Vietnam's digital economy depends on integrated reforms in infrastructure, institutions, and human capital. Comparative studies find that successful models (e.g. Singapore's "Smart Nation", South Korea's high-tech R&D push, China's massive digital commerce) combine open policies, robust public investment in ICT, and strong public-private collaboration. We build on these insights to guide our analysis of Vietnam's situation.

3. Methodology (Qualitative Policy Analysis)

This study employs a qualitative policy analysis approach. We conducted a systematic review of policy documents (e.g. government programs, ministerial decisions), industry reports (e.g. World Bank, UN agencies), and statistical data (Vietnam GSO, MIC). To structure the analysis, we draw on established frameworks such as PESTLE (Political, Economic, Social, Technological, Legal, Environmental) and SWOT (Strengths, Weaknesses, Opportunities, Threats) used in digital economy research. We supplement this with international benchmarking: for each key issue, we compare Vietnam's metrics or policies with those of Singapore, South Korea, China, and the EU, drawing on sources from those contexts. Finally, based on identified gaps and best practices, we formulate forward-looking policy recommendations for 2025–2035. This qualitative synthesis is supported by evidence from official statistics and published analysis to ensure robust, evidence-based conclusions.

4. Current Landscape of Vietnam's Digital Economy

Vietnam's digital sector has expanded rapidly in recent years. In nominal terms, digital economy revenue (including e-commerce, telecom, digital technology services) is projected to reach ~\$45 billion by 2025, with forecasts up to

\$90–200 billion by 2030. By the end of 2023 it contributed over 12% of GDP, and recent estimates place it around 18–18.3% of GDP in 2024. According to a VnEconomy report, Vietnam's digital economy grew 20% in 2024 to account for ~18.3% of GDP, and the government targets raising this to 20.5% by 2025 (with revenue of ~\$52 billion). Moreover, Vietnam is among Southeast Asia's fastest-growing digital economies: a Google-Temasek report cited Vietnam's 28% YoY digital-sector growth in 2022 (the fastest in the region). In the ICT industry, Vietnam had an estimated 45,000 IT enterprises (11,200 in software) by 2023. The ICT sector revenue was about \$148 billion in 2022, growing ~8.7% over 2021, which dwarfed national GDP growth. The sector is a significant export engine: ICT exports reached a record \$136 billion in 2022 (over 30% of total exports). Key digital firms like FPT, Viettel, VNG, and Momo lead in software, telecommunications, and fintech. Startups in e-commerce (Shopee, Tiki), fintech (VNPAY, MoMo), and edtech (Topica, Monkey) have also scaled up. Vietnam's web platforms are widely adopted; for example, popular domestic apps (e.g. Zalo, MoMo) each have 5–10 million users.

On infrastructure, Vietnam has seen dramatic improvements in mobile and fixed networks. By 2023, almost all communes had 4G coverage, and 5G deployment is underway. The government targets "universal fiber-optic networks" in 80% of households and 100% of communes by 2025. Data centers and cloud services are growing: Vietnam's data center capacity is planned to reach ~1000 MW by 2030, reflecting a drive to meet digital demand. Powering these networks, Vietnam has increased internet penetration to ~80%, though urban-rural gaps remain.

Public digital infrastructure is also advancing. E-government services are expanding: Vietnam aims for 100% of public services online by 2025. The national database on population and digital ID efforts (VNeID) are intended to streamline citizen access to services and financial accounts. Fintech adoption is rising: in 2023, roughly half of adults had a bank account or e-wallet, compared to 41% in 2020. Cashless payments (QR, mobile wallets) have proliferated, though many transactions remain offline, especially in rural areas.

Overall, Vietnam's digital economy shows strong momentum: digital services and tech exports are booming, start-ups are attracting investment, and government programs (e.g. the 2021–2025 Digital Transformation Program) are in force. Nevertheless, growth has been uneven, setting the stage for the following analysis of key challenges.

4. Key Challenges

4.1 Infrastructure Gaps

Despite progress, Vietnam faces infrastructure constraints. Broadband and mobile coverage have surged, but quality and reach remain uneven. The World Bank notes that Vietnam's Internet reach (64% of people in 2020) lags behind high-income countries. Many rural areas still lack high-speed fiber or stable broadband, relying instead on slower mobile connections. Expanding 4G/5G networks, fiber-optic backbones, and rural broadband is therefore critical. The government's targets (80% household fiber by 2025, full smartphone/4G access, and 50% adult e-pay use) highlight the importance of closing these gaps. Additionally, Vietnam's digital infrastructure must scale: data centers and

cloud facilities are currently limited, leading to high costs and reliance on cross-border services. A recent program prioritizes building new data centers and cloud capacity through public-private investment. Until infrastructure deficits are addressed, digital services (e-commerce, IoT, Industry 4.0) will face bottlenecks.

4.2 Legal and Regulatory Frameworks

Vietnam's legal framework for the digital economy is evolving but remains incomplete. While Vietnam has enacted laws on cybersecurity and personal data protection, their implementation can be rigid. The World Bank and industry commentators warn that new rules (e.g. Personal Data Protection Decree, Cybersecurity Law) may restrict data flows and foreign participation if too stringent. For example, data localization requirements could hinder cloud services and cross-border trade. Similarly, e-commerce and digital payments have grown faster than tax and consumer protection rules; coordination among agencies is still limited. A US-ASEAN report notes "poor management of e-commerce and tax administration" due to lack of regulatory clarity. Intellectual property enforcement and digital contract standards also need strengthening. Comparatively, advanced economies continuously update digital regulations: Singapore regularly revises its digital trade rules, and the EU has implemented GDPR, DMA/DSA, and is rolling out the AI Act. Vietnam should likewise streamline its regulations to ensure trust and transparency without stifling innovation.

4.3 Human Capital and Skills

Digital skills shortages pose a major challenge. While Vietnam has a young population and growing IT talent pool, demand far outstrips supply. Government and industry estimates suggest Vietnam needs on the order of 1 million ICT professionals by 2025, but currently has far fewer qualified graduates. Universities and training programs struggle to keep pace with industry needs. The result is a talent gap in software development, cybersecurity, data science and emerging areas like AI. The World Bank highlights that up to 56% of Vietnam's workforce could be impacted by automation, underscoring the need for reskilling. OECD reviews similarly call for expanded vocational and continuing education to raise digital literacy and STEM competency. Without targeted investment in human capital including teacher training, industry partnerships, and overseas collaboration the shortage of IT professionals and managers will constrain the digital economy's potential.

4.4 Digital Divide and Inclusivity

Finally, **digital inclusion** remains uneven. Urban areas and youth are quick to adopt new technologies, but rural, elderly, and low-income populations lag behind. According to the World Bank, many rural communities lack familiarity with digital services, limiting the reach of e-government and e-commerce. For example, only 22% of adults had made any digital payment as of 2020, reflecting limited use of banking and smartphones outside cities. The government has set goals to increase digital signatures and online participation, but awareness is still low. To reap productivity gains from digitalization, Vietnam must address this divide through infrastructure deployment and digital literacy programs. Comparing globally, successful economies like Singapore

and South Korea pair universal connectivity with active training for older or rural residents. Vietnam's policies should likewise ensure that the benefits of digital growth are widely shared, closing urban-rural and gender gaps in access.

5. International Comparative Case Studies

Singapore: The city-state exemplifies a mature digital economy. In 2024, Singapore's digital sector reached S\$128.1 billion (~18.6% of GDP), growing faster than the overall economy. Its success is built on top-tier ICT infrastructure (ranked among world leaders) and a holistic "Smart Nation" strategy. Over 95% of Singaporean SMEs had adopted at least one digital tool by 2024. The government continuously updates digital regulations and invests heavily in AI and cybersecurity. For example, Singapore's IMDA launched multiple initiatives (AI Verify, GenAI sandbox, etc.) to drive adoption. Lesson for Vietnam: a clear vision and sustained R&D support can lift an economy's digital share above 15–20%, but requires top-down integration and inclusive policies.

South Korea: South Korea's economy is underpinned by its ICT industry. In 2022, Korea's ICT sector alone comprised about **13% of GDP**. The country boasts world-class telecom networks (1st in mobile broadband connectivity) and global tech firms (Samsung, LG). Its digital strategy emphasizes 5G/6G rollouts, digital government, and smart manufacturing. Korea is also notable for high R&D spending (4.6% of GDP) and digital literacy. Challenges it faces include an aging population adapting to digital change, but overall South Korea shows how concerted investment in tech infrastructure and industry R&D can generate a leading digital economy. Vietnam can draw parallels by fostering tech R&D and opening markets (as Korea did in its telecom laws).

China: China hosts one of the world's largest digital economies: \$7.1 trillion in 2021, ~40% of GDP. Chinese consumers embraced e-commerce and mobile payments years earlier, and digital giants (Alibaba, Tencent, Baidu) drive innovative services from fintech to social commerce. The government's 14th Five-Year Plan prioritizes digitalization across all sectors, including AI, 5G, and industrial IoT. Infrastructure is pervasive: China has the world's largest 5G network (millions of base stations). However, China's model also involves heavy state oversight of data and technology platforms (e.g. recent tightening of tech firms). For Vietnam, China illustrates the scale that digitalization can reach (double Vietnam's GDP share) but also signals the need for balanced governance: supporting local champions while maintaining competitive markets.

European Union: The EU's experience highlights a different path. The EU digital economy is strong in services and high-tech exports, though still smaller relative to the US. European countries have prioritized regulatory frameworks: the EU has enacted GDPR, the Digital Markets Act, and an AI Act, aiming to create a "human-centric" digital society. These laws ensure privacy, competition, and consumer protection, but can impose compliance burdens especially on SMEs. The EU also invests in digital skills (Digital Skills and Jobs Coalition) and cross-border infrastructure. For Vietnam, the EU case suggests the importance of setting clear digital rules (to build trust in e-commerce and investment) but also ensuring they remain adaptive and not overly constraining. International

cooperation (e.g. Vietnam joining digital economy partnerships) can also help align Vietnam with global standards.

In summary, these case studies show that diverse models can succeed: **Singapore and Korea** achieved high digital GDP shares through top-down infrastructure and innovation; **China** scaled massively through market competition and state support; **EU** focuses on harmonized regulations and skills. Vietnam's strategy can blend these lessons, aiming for high connectivity and innovation while safeguarding openness and inclusive regulation.

6. Policy Directions and Recommendations (2025–2035)

Building on Vietnam's goals and international lessons, the following policy directions are recommended:

Accelerate Infrastructure Investment: Continue expanding high-speed broadband and 5G nationwide. The government's targets (universal fiber in communes, 5G rollout, digital ID coverage) should be met and extended towards rural and mountainous areas. Public-private partnerships can mobilize funds: the 2025–2030 “digital infrastructure” program should be fully implemented to build data centers, cloud platforms, and IoT networks. Encourage competition and reduce barriers to entry (as OECD suggests, liberalize telecom markets and finalize the new Telecom Law), which will attract more foreign and domestic investment.

Enhance Legal and Regulatory Frameworks: Streamline and harmonize digital laws to foster trust and participation. Review the personal data protection and cybersecurity regulations to ensure they protect privacy without unnecessarily restricting cross-border data flows. Implement clear e-commerce and digital contract laws to reduce uncertainty for businesses. Vietnam can draw on Singapore's agile approach of regularly updating digital regulations. Strengthen intellectual property enforcement for software and content. To promote competition, the OECD recommendation to empower regulators (e.g. telecom and competition authorities) should be adopted. Establish transparent digital governance (open data platforms, digital signatures) to boost digital trust as planned.

Invest in Human Capital: Address the digital skills gap with aggressive education reform. Increase funding for ICT and STEM education at all levels. The Ministry of Education should integrate coding, AI literacy, and digital design into curricula. Expand vocational training centers and tech “boot camps” (as recommended by OECD) in partnership with industry (FPT, Viettel, foreign tech firms). Provide incentives (scholarships, career promotion) for IT teachers and professionals to join the digital education ecosystem. Promote lifelong learning and upskilling via online platforms. Encourage top universities to form “Innovation Campuses” with global partners (as Samsung did in Hanoi) to build research capacity. Ensuring a steady pipeline of skilled graduates and mid-career retraining programs is crucial for sustaining innovation.

Promote Inclusive Digital Adoption: Launch nationwide digital literacy campaigns targeting rural areas, the elderly, and small businesses. Build on the existing e-government push by simplifying online services (one-stop digital portals) so all citizens can transact with government and businesses online. Subsidize Internet access or devices for under-served communities. Expand financial inclusion: pursue the 2025 target of 50% adults using digital signatures and accounts by

collaborating with banks and telecoms on mobile banking. Lessons from Singapore show that near-universal digital readiness requires parallel efforts in hardware (device affordability) and training (e.g. community digital centers).

Foster Innovation and Local Industry: Encourage R&D and startup growth through tax incentives and grants. Continue Vietnam's “Make in Vietnam” policy for digital products, helping firms like FPT become global players. Form technology parks and incubators with global linkages. Support high-tech sectors (AI, fintech, semiconductors) as identified in the Digital Economy targets. Engage the private sector in policymaking – as seen in the proposed Digital Technology Industry Law – to ensure regulations and support schemes meet industry needs. Implement the Central Economic Commission's recommendation to create an “ecosystem of digital citizens,” fostering a culture of innovation and digital entrepreneurship.

Strengthen International Cooperation: Finally, position Vietnam in regional and global digital frameworks. Align standards with ASEAN and APEC digital economy commitments (e.g. cross-border data flows, electronic commerce rules). The recently ratified EU-US Data Privacy Framework suggests Vietnam could similarly pursue data adequacy agreements. Participate in multilateral tech cooperation (e.g. Belt and Road Initiative on digital projects, ASEAN Smart City Network). Learning from Korea's open market approach, attract foreign tech firms to invest in Vietnam (e.g. call centers, R&D centers) by offering stable, transparent policies and adequate infrastructure.

These policy directions, if well executed, would help Vietnam meet its **targets** of 25% digital-GDP by 2025 and 30% by 2030. They are consistent with the National Digital Transformation Program and international best practices. Key enabling factors will be political commitment, coordination across ministries, and public-private dialogue to regularly adjust policies as technology evolves.

7. Conclusion

Vietnam stands at a pivotal juncture in its digital transformation. The country has achieved impressive growth in its digital economy, but to sustain and accelerate this trend requires addressing fundamental challenges in infrastructure, regulation, skills, and inclusion. This paper has provided a comprehensive, evidence-based analysis of Vietnam's digital economy, drawing on a wide array of reputable sources. We have shown that Vietnam's current digital economy (roughly one-fifth of GDP) can grow further by learning from international peers and tailoring policies to its context. By investing in broadband and data centers, clarifying digital laws, cultivating talent, and fostering inclusive digital adoption, Vietnam can harness digital technologies for broad-based economic progress. Policymakers should heed both the ambition of Vietnam's own strategic plans and the practical lessons from abroad. With coordinated reforms and continuous innovation, Vietnam can achieve a high-performance digital economy by 2035, supporting its broader development goals.

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