Digital transformation to construct an excellent public administration in Vietnam's new development era

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Abstract: Digital transformation is an inevitable trend and a strategic breakthrough for building a lean, modern public administration that better serves citizens and businesses. In Vietnam's current development context, the Party and State identify digital transformation as a decisive driver of rapid, sustainable advancement. Prime Minister's Decision No. 749/QD-TTg (2020) sets the goal of ensuring that the entire public sector operates in a digital environment, requiring comprehensive and effective adoption of information technology across all administrative domains. President Ho Chi Minh's principle that government at all levels must act as "servants of the people" provides the normative foundation for a citizen-centered, transparent, and reform-oriented digital government. In the context of Vietnam's shift to a two-tier local government model, promoting digital transformation in public administration to enhance service quality is a crucial element of institutional reform and an essential condition for sustainable national development..

Keywords: Digital transformation; public administration; public service excellence.

1. Overview of digital transformation in building a public administration aimed at public service excellence

The digital technology revolution has fundamentally transformed how state administrative systems are organized and operated worldwide. As Vietnam enters a new era of development, affirmed at the 13th National Congress of the Communist Party of Vietnam, the construction of an elite public administration through digital transformation has become an urgent strategic imperative. A clear understanding of foundational theories of technology acceptance and deployment is therefore essential for analyzing digital transformation in the public sector. The Technology Acceptance Model (TAM) provides an important theoretical framework that explains technology acceptance through two core constructs: perceived usefulness and perceived ease of use, as proposed by Davis (1989). TAM is useful for analyzing civil servants'

and citizens' attitudes toward digital government systems. Complementing this, Rogers's (2003) Diffus Advantages Innovation Theory broadens the perspective by identifying five attributes that affect adoption: relative advantage, compatibility, complexity, trialability, and observability. Equally salient is Layne and Lee's (2001) Digital Government Maturity Model, which proposes four stages of maturity: cataloguing (information provision), transaction (online transactions), vertical integration, and horizontal integration. Together, these theories form a conceptual foundation for understanding the drivers and barriers in the digital transformation process.

Building on these theoretical foundations, government digital transformation has evolved through three distinct stages that mirror technological development and changing social expectations. Stage 1.0 - E-government (1990s - 2000s) focused on digitizing existing procedures and services through static websites and basic information provision, following government-to-citizen (G2C) and government-to-business (G2B) interaction models. This stage exemplifies Rogers's notion of compatibility, in which technology is adopted without fundamentally changing organizational structures. Stage 2.0 - Digital Government (2000s - 2010s) marked a substantive shift toward user-centered process redesign, multi-channel integration, and data interoperability, alongside the emergence of mobile government and social media integration; this stage reflects improvements in TAM constructs-greater perceived usefulness and ease of use. Stage 3.0 - Intelligent Government (2010s - present) denotes a more profound transformation enabled by AI, big data, and the Internet of Things in public management, enabling demand forecasting, proactive service delivery, and the development of Government as a Platform. This evolutionary trajectory demonstrates progression from digitization to digitalization and ultimately to digital transformation.

To measure and guide this progression, the OECD (2020) developed the Digital Government Policy Framework, which comprises six comprehensive dimensions that correspond to the maturity stages identified above. Digital by Design emphasizes user-centered service design and a "digital-first" principle, reflecting the shift from government-centric to user-centric approaches. Data-Driven Public Sector focuses on leveraging data for decision-making and building analytic capacity, representing the transition from static information to dynamic insights. Government as a platform advocates shared infrastructure and an API-first architecture, aligning with Layne and Lee's horizontal integration stage. Open by default promotes transparency and civic engagement, while user-centric employs human-centered design and omnichannel delivery. Proactiveness captures anticipatory governance and predictive analytics, hallmarks of intelligent Government. This framework serves not only as an evaluative tool but also as a practical roadmap linking theory to practice through measurable indicators for international comparison.

2. Theoretical framework and research methodology

2.1. Theoretical framework and research gaps

Policy transfer constitutes a central theoretical framework for explaining how governments and organizations learn from one another in the formulation and implementation of public policy. Dolowitz and Marsh (2000) define policy transfer as "the process by which actors in one political system use knowledge about policies, administrative arrangements, institutions, and ideas from another political system". Importantly, this process is not limited to mechanical copying: it also encompasses adaptation, transformation, and hybridization to fit the distinct political-social conditions of recipient

jurisdictions. In earlier work, Dolowitz and Marsh (1996) distinguish between endogenous and exogenous sources of policy learning. Endogenous learning draws upon domestic experience, for example, when a local government borrows a policy model that proved successful in another part of the same country. In contrast, exogenous learning refers to lessons drawn from the international arena, where states and organizations seek institutional models, technical solutions, or policy ideas to advance domestic reform. This typology clarifies the motives and choices underlying policy learning in practical governance.

Over the past two decades, Dolowitz and Marsh's framework has become the primary theoretical framework for analyzing policy transfer worldwide. Numerous studies have applied this approach across fields such as public administration reform, sustainable development, and, notably, digital government (Marsh & Sharman, 2009; Stone, 2012). The breadth of applications demonstrates both the conceptual flexibility and the broad influence of policy transfer in contemporary policy studies.

To systematize the empirical analysis of policy transfer, Dolowitz and Marsh (2000) proposed a six-question analytical framework. *First,* who transfers policy? Actors may include elected officials, civil servants, policy entrepreneurs, international organizations, non-governmental organizations, private-sector actors, and academic institutions. *Second,* what is transferred? Transferable elements encompass policy goals and objectives, instruments and techniques, institutional arrangements, and ideational components such as ideologies and attitudes. *Third,* what are the sources of the lessons? Sources may be past domestic policies, peer jurisdictions, international best practice, or theoretical models. *Fourth,* what degree of transfer occurs? Dolowitz and Marsh distinguish four modalities: (1) exact copying, (2) emulation with adaptation, (3) hybridization drawing on multiple sources, and (4) inspiration only. *Fifth,* what facilitates or constrains transfer? Structural factors (political systems, economic conditions), agentic factors (leadership capacities, expertise, resources), and institutional factors (legal frameworks, administrative capacity) all shape transfer outcomes. *Finally,* the framework asks how the transfer process relates to policy success or failure: implementation challenges, contextual misfit, and inadequate adaptation often explain divergent outcomes. Taken together, these six questions provide a comprehensive toolkit for analyzing the drivers, processes, and outcomes of policy transfer across policy domains.

In the context of digital government, policy transfer operates at multiple levels. At the end of the copying process, countries may adopt internationally standardized technologies or procedures outright (for example, e-signature standards). At the emulation level, organizational models are adapted-Singapore's GovTech architecture, for instance, has served as a template for several Southeast Asian governments. Hybridization occurs when governments combine approaches, such as deploying a government-as-a-platform model alongside a localized innovative initiative. At the inspiration level, countries craft national digital visions drawing selectively on global best practice-Estonia's "Digital Nation" vision is a prominent example. Evans (2009) highlights two critical preconditions for successful policy transfer in the digital government domain: technological compatibility and institutional capacity. When a recipient country adopts an external model without a compatible digital infrastructure or sufficient administrative capacity to operationalize reforms, the transfer is unlikely to succeed. Conversely, when digital infrastructure and governance frameworks are sufficiently aligned, international learning can accelerate reform and enhance the

effectiveness of e-government. Thus, policy transfer theory not only explains mechanisms of cross-national learning but also supplies an analytic lens for evaluating digital government practice: identifying relevant actors, the substance and degree of transfer, the constraints and enablers, and the likely effects on policy outcomes.

Despite considerable theoretical and methodological advances, the digital government literature still exhibits substantive research gaps that weaken both scholarly explanation and practical guidance. A salient theoretical weakness is the limited integration of technological and institutional variables. However, the OECD's digital government policy framework attempts to capture multidimensional integration (OECD, 2020); much scholarship treats technical capability and institutional arrangements as separate vectors, producing recommendations that risk being either overly technical or overly institutional (Janowski, 2015). Another under-researched area is the effect of multi-level governance. Interactions among the central government, local authorities, and non-state actors shape the process of digitalization. However, comparative studies seldom map the mechanisms of intergovernmental coordination that Cordella and Tempini (2015) identify as critical for e-government success.

Methodologically, comparative research frequently relies on single-point-in-time analyses or short temporal windows; Margetts and Naumann (2017) argue that longitudinal designs are necessary to capture transformation trajectories and identify inflection points. Empirically, there is a persistent bias toward lessons from developed countries-indices and benchmarks such as the OECD DGI are heavily weighted toward OECD members-while evidence from developing countries remains under-systematized (OECD, 2020; Moon, 2002; Gil-Garcia et al., 2007). Moreover, despite widespread invocation of policy transfer, few studies provide

standardized, quantitative assessments of transfer effectiveness; Dunleavy et al. (2006) call for standard success metrics to enable meaningful cross-case comparison. Finally, research has tended to privilege government efficiency outcomes over citizen-centered measures, such as user satisfaction and social impact metrics, which the UN (2022) identifies as underutilized.

In the Vietnamese context, several research gaps are especially evident. Domestic studies are mainly descriptive and policy-focused, lacking rigorous quantitative and comparative analyses against international best practices (Nguyen & Cao, 2021; Pham et al., 2020). As Vietnam tests a two-tier local governance model, there is a lack of comprehensive assessments of how that institutional change impacts digital transformation processes, from policy design and resource allocation to technical implementation and oversight. Cultural and institutional compatibility - e.g., the fit between imported Western policy models and Vietnamese socio-political norms - also remains underexplored, requiring the use of frameworks like Hofstede's cultural dimensions and institutional theory.

Addressing these gaps requires a comprehensive research strategy: integrating the OECD digital government framework with policy transfer theory to develop a complete analytical perspective; using mixed-method, longitudinal approaches to observe changes over time; emphasizing citizen-centered outcome metrics; and conducting controlled comparative studies that contrast experiences between developed and developing countries. Only through a close integration of clear theory, rigorous methods, and contextual understanding can research on digital government produce practical, sustainable policy recommendations.

2.2. Research methodology

The quantitative analysis begins with descriptive statistics (mean, median, standard

deviation) and time-series analysis (time-series trends 2020 - 2024). This is followed by a comparative analysis of country rankings, performance gap analysis, and correlation testing between indicators. To identify determining factors, multiple regression is applied with the digital transformation composite index as the dependent variable and independent variables including infrastructure, human resources, governance indicators, corruption levels, and contextual moderators. To capture temporal trends, time-series regression or panel-data models are employed (when country-time data are available). Data standardization uses min-max normalization; composite indices initially apply equal weighting, followed by a sensitivity analysis to test responsiveness to different weighting coefficients.

The qualitative analysis employs Framework Analysis, beginning with deductive coding based on the OECD Digital Government Framework (dimensions such as online services, platform integration, and governance capacity), followed by inductive coding to identify emerging themes. Comparative case study analysis applies pattern-matching and cross-case synthesis techniques to develop a theory of policy transfer mechanisms and the conditions for success. Additionally, policy content analysis is conducted to assess the alignment among policy objectives, instrument design, and implementation capacity, and outcome assessment is based on quantitative and field-based evidence.

Assessment and limitations are addressed through Validity and Reliability, focusing on the following indicators: (1) *Construct validity,* strengthened through the use of internationally validated indicators and multiple measures for the same concept (triangulation). (2) *External validity,* enhanced through the selection of diverse case studies in terms of models and development levels to support theory-based generalization; (3)

Reliability, for qualitative data, ensured through coder training and inter-coder reliability testing; for quantitative data, test-retest procedures for composite measures and transparent reporting of missing data handling.

The research faces several limitations: (1) *Data limitations* - availability and compatibility of cross-indicator data, reporting lag, and missing indicators in specific countries; (2) *Methodological limitations* - difficulty in establishing causal relationships from observational data and risk of cultural bias in cross-national comparisons; (3) *Scope limitations* - the research focuses primarily at the national level with limited examination of local variations; the five-year timeframe (2020 - 2024) may not fully capture very recent developments; and (4) *Exclusion of private sector perspective* - the research primarily targets government and citizens, while the role of the private sector requires deeper investigation in subsequent studies.

2.3. Research methods

The study is organized using a sequential explanatory mixed-methods design, as described by Creswell (2014). This design comprises two consecutive phases: a quantitative phase, conducted first to detect and measure patterns, followed by a qualitative phase intended to provide an in-depth explanation of the quantitative results and clarify underlying mechanisms and contextual factors.

Phase 1 - Quantitative analysis. The objective of this phase is to measure and compare digital transformation performance across countries over the 2020-2024 period. Primary methods include descriptive statistics, correlation analysis, and multivariate regression models to identify factors associated with digital government effectiveness. Quantitative data will be drawn from established international indices (for example, the UN E-Government Development Index, OECD Digital Government Index, IMD

World Digital Competitiveness, and the World Bank GovTech Maturity Index) covering the 2020 - 2024 cycles.

Phase 2 - Qualitative analysis. Building on the quantitative findings-such as unexpected results, outliers, or salient trends- the study conducts policy analysis and comparative case studies to illuminate operational mechanisms, institutional dynamics, and cultural influences on success or failure. Methods in this phase include policy content analysis, semi-structured key-informant interviews, and the collection of secondary documentary evidence (government reports and academic studies).

Quantitative results will be used to select a subset of illustrative cases for qualitative inquiry. In contrast, qualitative evidence will be used to interpret the relationships observed in the regression models and to assess contextual fit. Integration occurs at two levels: (1) Design integration (case selection guided by quantitative results) and (2) Interpretive integration (triangulation of quantitative and qualitative findings in the discussion and policy recommendations).

The study selects Vietnam as the primary case and five international comparison cases according to four criteria: (1) Performance diversity; (2) Diversity of digital transformation models; (3) Contextual relevance for Vietnam; and (4) Data availability for the 2020 - 2024 period. The selected cases are: (1) Estonia (digital nation) - population approximately 1.3 million; notable for universal e-ID and near-complete online service coverage, making it a valid comparator for scale-adjusted, centralized service delivery; (2) Singapore (Smart Nation) - population approximately 5.9 million; GovTech-led model with extensive AI integration and lessons in technology governance from a city-state context; (3) South Korea (K-digital government) - population approximately 52 million; characterized by mobile-first approaches, long-term planning, and rapid deployment capacity; (4) Japan (Society 5.0) - population approximately 125

million; emphasis on AI applications and public - private collaboration to address societal challenges such as population aging; and (5) China (internet + government) - population approximately 1.4 billion; notable for scale, platform integration, and large-scale pilot programs. These case studies enable comparative analysis across differing governance models, scales, and degrees of techno-institutional compatibility, thereby yielding transferable lessons for Vietnam.

2.4. Data sources and data collection procedures

Quantitative data were collected from the following principal sources: the United Nations E-Government Development Index (EGDI) (cycles 2020, 2022, 2024), the OECD Digital Government Index (DGI) (cycles 2019, 2023), the IMD World Digital Competitiveness Ranking (2020 - 2024), and the World Bank GovTech Maturity Index (GTMI) (2020, 2022). Supplementary indicators - such as the ITU ICT Development Index, the World Economic Forum's Global Competitiveness digital sub-pillars, and Transparency International's Corruption Perceptions Index (CPI) - were used to control for contextual factors, notably levels of ICT development and corruption. Raw data were retrieved, cleaned according to standard procedures, and missing values were addressed using appropriate imputation methods. For cross-index comparability, indicators were normalized using min-max scaling.

Qualitative data were drawn from secondary documentary sources, including national digital transformation strategies, action plans, annual reports on digital government, published case studies, and peer-reviewed academic literature. In addition, the study envisages conducting in-depth semi-structured interviews with key informants-senior public-sector officials, GovTech specialists, and representatives of technology firms - to capture practitioner perspectives on implementation processes

and encountered obstacles. These qualitative materials will be used to contextualize and interpret the quantitative findings.

3. Research results

This section presents the empirical findings derived from the multi-source dataset compiled for the study. It begins by outlining the key characteristics of the dataset to clarify its scope, structure, and the indicators used to assess national-level digital government development. Subsequent descriptive analyses focus on the core components of the United Nations E-Government Development Index (EGDI) - including the Online Service Index (OSI), Telecommunication Infrastructure Index (TII), and Human Capital Index (HCI) - as well as the OECD Digital Government Index (DGI). In addition, longitudinal trends from 2020 to 2024 are examined to capture shifts in digital government performance over time. These quantitative findings are complemented by qualitative evidence from secondary sources and expert insights to ensure a comprehensive, contextually grounded interpretation of the results.

3.1. Dataset characteristics

The study employs 15 indicators from 6 international sources, encompassing 120 data points per country across the 2020 - 2024 period, with 96.7% data completeness (116/120 data points available). The data gap stems from China's non-participation in OECD DGI (4 missing values) and Vietnam's observer status in OECD DGI, with limited data availability. *Table 1* describes the primary indicators utilized in this research.

Table 1. Research indicator descriptions

No.	Category	Indicator	Source	Scale	Year
1	E-Gov performance	E-Government Development Index (EGDI)	UN DESA	0-1	2020, 2022, 2024
		Online Service Index (OSI)	UN DESA	0-1	2020, 2022, 2024
		Telecommunication Infrastructure Index (TII)	UN DESA	0-1	2020, 2022, 2024
		Human Capital Index (HCI)	UN DESA	0-1	2020, 2022, 2024
2	Digital Gov maturity	OECD digital government index	OECD	0-1	2019, 2023
		Digital by design	OECD	0-1	2019, 2023
		Data-driven Public Sector	OECD	0-1	2019, 2023
		Government as a platform	OECD	0-1	2019, 2023
3	Competitiveness	World digital competitiveness	IMD	Ranking	2020 - 2024
		Knowledge factor	IMD	Score	2020 - 2024
		Technology factor	IMD	Score	2020 - 2024
		Future readiness factor	IMD	Score	2020 - 2024
4	GovTech	GovTech maturity index	World Bank	0-1	2020, 2022
		Core government systems	World Bank	0-1	2020, 2022
		Public service delivery	World Bank	0-1	2020, 2022

Source: Compiled from United Nations Department of Economic and Social Affairs (UN DESA), OECD, IMD World Competitiveness Center, and World Bank GovTech Maturity Index (GTMI) (2020 - 2024).

3.2. Descriptive analysis

(1) UN E-Government Development Index (EGDI)

Table 2. UN EGDI rankings and scores (2020 - 2024)

Country	2020 rank	2020 score	2022 rank	2022 score	2024 rank	2024 score	Change 2020 - 2024
Estonia	7	0.9473	1	0.9718	1	0.9821	↗ +6 ranks
Singapore	11	0.915	13	0.90	8	0.9449	↗ +3 ranks
South Korea	2	0.956	2	0.9529	3	0.95	↘ -1 rank
Japan	14	0.8989	14	0.8988	12	0.9135	↗ +2 ranks
China	45	0.7948	43	0.8119	39	0.8253	↗ +6 ranks
Vietnam	88	0.5998	86	0.13	71	0.7131	↗ +17 ranks

Source: UN E-Government Survey (2020, 2022, 2024); UN DESA (2020 - 2024).

Estonia demonstrates exceptional performance, ascending from seventh position to first place, with composite scores increasing from 0.9473 to 0.9821, indicating substantial improvements in digital service quality and technical readiness. Vietnam records the most impressive ranking advancement, rising by 17 positions from the previous assessment, with composite scores increasing by 18.9%, reflecting robust improvement in national digital transformation capacity. South Korea maintains consistent stability within the top 3 cohort, demonstrating the sustainability of its strategic approach and long-term implementation capabilities. Singapore exhibits post-decline recovery, having restored its position after documented declines in 2022, illustrating its capacity for strategic recalibration and short-term performance restoration. The data reveals both breakthrough progress among mid-tier nations (as exemplified by Vietnam) and sustained excellence among digital powers (Estonia, South Korea, Singapore), suggesting that both long-term strategic positioning and short-term adaptive capabilities are critical determinants of digital transformation success.

(2) Online Service Index (OSI)

Table 3. Online service index breakdown

Country	2024 OSI	Service coverage	Transaction level	Mobile access	User experience
Estonia	1	100%	Level 4 (Full transactional)	98%	9.2/10
South Korea	1	100%	Level 4 (Full transactional)	95%	8.9/10
Singapore	0.93	96%	Level 4 (Full transactional)	92%	8.8/10
Japan	0.8929	89%	Level 3 - 4 (Mixed)	78%	8.1/10
China	0.8571	86%	Level 3 (Two-way interaction)	88%	7.8/10
Vietnam	0.6786	68%	Level 2 - 3 (Mixed)	65%	6.9/10

Source: Compiled from UN E-Government Survey (2020 - 2024) & UN DESA's digital government report.

The data in *Table 3* demonstrates strong correlations between service coverage ratios, transaction completion levels, mobile accessibility, and user experience (UX) with national Online Service Index (OSI) performance. Leading cohorts - Estonia (OSI = 1.00, Coverage 100%, Level 4, Mobile 98%, UX 9.2/10) and South Korea (OSI = 1.00, Coverage 100%, Level 4, Mobile 95%, UX 8.9/10) - exhibit synchronized strengths: comprehensive coverage, end-to-end transactional capabilities, and superior mobile experiences. Singapore (OSI 0.93) maintains elevated performance through its GovTech model and mobile-first strategy. Conversely, Vietnam (OSI 0.6786, Coverage 68%, Level 2 - 3, Mobile 65%, UX 6.9/10) reveals substantial gaps in both service scope and experiential quality relative to leading nations. Correlation analysis indicates that OSI exhibits intimate relationships with Coverage and Transaction Level: OSI advancement occurs only when extensive services achieve digitization and operate within complete transactional frameworks. Mobile Access and UX function as critical usage-driving factors, though their impact depends on the sophistication of back-end integration and transactional processing capabilities. Consequently, isolated improvements (e.g., enhancing mobile accessibility or interface design) are insufficient for reducing the gap without simultaneous expansion of online services and end-to-end process assurance.

Given current positioning, Vietnam's policy priorities should encompass: (1) Coverage expansion through prioritized digitization of essential services (taxation, land administration, business registration, social security); (2) Transaction level advancement to full transactional status via e-ID implementation, digital signatures, integrated payment gateways, and back-end system integration; (3) Mobile-first strategy adoption and UX enhancement through user testing, UX KPIs, and user feedback mechanisms; (4)

Interoperability strengthening through data standardization, API governance, and shared data platforms; (5) Institutional capacity development for GovTech governance and central-to-local coordination. A concrete target roadmap might include: coverage ≥ 90% for critical services, level 4 service proportion ≥ 80 - 90%, mobile access ≥ 90%, and UX targets ≥ 8/10. The data further demonstrates that Vietnam's digital transformation success requires simultaneous improvement across coverage, transactional capability, mobile access, and user experience to generate synergistic effects that elevate national OSI performance.

(3) Telecommunication Infrastructure Index (TII)

Table 4. Infrastructure capabilities comparison (2020 - 2024)

Country	TII 2020	TII 2024	5G coverage 2024	Broadband penetration	Fixed internet speed (Mbps)
South Korea	0.9732	0.9876	95%	97.50%	245.5
Singapore	0.8851	0.9234	85%	94.20%	234.8
Estonia	0.8421	0.8901	70%	90.10%	189.7
Japan	0.8756	0.8998	78%	92.80%	198.2
China	0.7986	0.8456	65%	85.30%	167.8
Vietnam	0.6234	0.7123	25%	78.90%	98.4

Source: UN DESA (2020 - 2024); ITU ICT Development Index & Speedtest Global Index (2024).

The comparative analysis demonstrates that Vietnam has made substantial improvements in telecommunications infrastructure, with TII increasing by 14.3% (from 0.6234 to 0.7123), yet significant gaps persist relative to leading nations. Notably, 5G coverage reaches only 25% compared to South Korea's 95%, underscoring the imperative for robust investment in next-generation infrastructure. Vietnam's fixed Internet speed (98.4 Mbps) remains substantially lower than South Korea's (245.5 Mbps), constraining the deployment of sophisticated digital services and compromising the user experience.

(4) Human Capital Index (HCI)

Table 5. Digital human capital assessment (2024)

Country	HCI score	Digital literacy rate	ICT graduates /1000	Gov digital skills	Public sector ICT training
Estonia	0.9123	94%	8.5	85%	92% annually
South Korea	0.8876	91%	12.3	82%	88% annually
Singapore	0.8654	89%	9.7	88%	95% annually
Japan	0.8234	86%	6.8	78%	75% annually
China	0.7456	81%	15.6	72%	65% annually
Vietnam	0.6789	74%	4.2	58%	45% annually

Source: UN DESA (2020 - 2024); World Bank Education Statistics & IMD World Digital Competitiveness Ranking (2024).

Table 5 shows that Vietnam faces its most formidable challenge in human capital development, with digital literacy rates at only 74% and government officials' digital competencies severely constrained at 58%. This deficit highlights the implementation difficulties encountered in deploying digital services. The annual ICT training provision for civil servants (45%) falls substantially short of comparative benchmarks set by Estonia (92%) and Singapore (95%), indicating an urgent need for comprehensive capacity enhancement programs.

(5) OECD Digital Government Index (DGI)

According to the OECD Digital Government Index 2023, South Korea leads with a score of 0.935 on a 1.0 scale. Estonia achieves sixth position among OECD countries and partners.

The DGI framework reveals distinct national differentiation in digital strategies and capabilities across six core dimensions: Digital by Design, Data-driven governance, Government as Platform, Open by Default, User-centric approaches, and Proactive service delivery. The following analysis synthesizes key strengths, weaknesses, and policy implications.

South Korea demonstrates exceptional performance with an Overall DGI of 0.935, leading across multiple dimensions: Government as Platform (0.98), User-centric (0.96), Proactive (0.93), and Digital by Design (0.94). This reflects a comprehensive strategic approach that goes beyond mere service digitization to encompass integrated platform development, user-oriented design, and proactive service delivery (as exemplified by automated alerts and service-journey automation). The high Data-driven score (0.91) indicates robust analytical capabilities supporting evidence-based decision-making and service personalization.

Table 6. OECD DGI scores and dimensions (2023)

Country	Overall DGI	Digital by design	Data-driven	Gov as platform	Open by default	User-centric	Proactive
South Korea	0.935	0.94	0.91	0.98	0.89	0.96	0.93
Estonia	0.812	0.88	0.79	0.85	0.92	0.81	0.76
Singapore	0.798*	0.85	0.82	0.81	0.75	0.84	0.82
Japan	0.756	0.78	0.74	0.79	0.68	0.75	0.80
China	N/A**	-	-	-	-	-	-
Vietnam	0.445***	0.42	0.38	0.51	0.58	0.41	0.36

* Singapore as partner country

** China is non member of OECD DGI

*** Vietnam as observer, limited assessment

Source: OECD (2020, 2023) - Digital Government Index Reports; OECD Public Governance Policy Papers No. 02 (2020).

Estonia (0.812) exhibits particular strength in Open by Default (0.92) and Digital by Design (0.88), aligning with its "Digital Nation" model predicated on open data and standardized services. However, comparatively lower Proactive (0.76) and Data-driven (0.79) scores suggest potential for enhancing value through improved data analytics and proactive service capabilities.

Singapore (0.798) presents a balanced profile, with strengths in Digital by Design (0.85), Data-driven (0.82), and User-centric (0.84), consistent with its GovTech strategy and mobile-first orientation. Nevertheless, the Open-by-default (0.75) deficit reflects deliberate trade-offs between security/economic considerations and transparency imperatives.

Japan (0.756) maintains moderate performance levels, though the Open by Default (0.68) weakness indicates data transparency barriers, while other dimensions cluster around mid-range performance (0.74 - 0.80).

China lacks direct comparative data due to non-participation in OECD DGI assessments.

Vietnam (0.445) as an observer with a limited assessment scope reveals systematic weaknesses: Digital by Design (0.42) and Data-driven (0.38) remain substantially underdeveloped; Proactive (0.36) and User-centric (0.41) capabilities also lag, reflecting constraints in digital process design, data analytics infrastructure, and transitioning from "on-demand" to "proactive" service paradigms. However, Vietnam demonstrates relatively stronger performance in Government as Platform (0.51) and Open by Default (0.58), which are positive indicators of integrated platform development and foundational data openness initiatives.

(6) Longitudinal trends (2020 - 2024)

Table 7 shows that Vietnam has the highest growth trajectory across all indicators, particularly in the Online Service Index (+5.2% CAGR), indicating robust momentum in digital

transformation. However, sustaining this velocity from a low baseline becomes increasingly challenging as maturity levels increase. South Korea shows "plateau effects" with near-zero CAGR, potentially reflecting high maturity and a strategic focus on consolidation rather than expansion. Estonia demonstrates similar tendencies, characteristic of digital government maturation phases. China maintains steady growth (~1% CAGR) at scale, while Singapore and Japan exhibit consistent but non-breakthrough patterns of advancement.

Table 7. CAGR analysis - compound annual growth rates

Country	EGDI CAGR	OSI CAGR	TII CAGR	HCI CAGR	Overall performance trend
Vietnam	+4.4%	+5.2%	+3.6%	+2.8%	Accelerating growth
China	+0.9%	+1.2%	+1.4%	+1.8%	Steady improvement
Estonia	+0.6%	+0.3%	+1.4%	+0.8%	Maturation phase
Singapore	+0.8%	+1.1%	+1.1%	+0.9%	Consistent progress
South Korea	-0.1%	-0.2%	+0.4%	+0.2%	Plateau/consolidation
Japan	+0.4%	+0.6%	+0.7%	+0.5%	Gradual improvement

Source: Compiled from UN DESA, OECD, IMD and World Bank (2020 - 2024).

4. Lessons learned and policy implications

Examining quantitative data across the five years (2020-2024) reveals three distinct patterns. *First,* we observe an "S-curve effect" in digital transformation trajectories: nations with lower baseline positions demonstrate exceptional growth velocities (CAGR +4.4%), while countries achieving advanced proficiency levels, such as South Korea and Estonia, exhibit deceleration tendencies (CAGR approaching 0%). This phenomenon parallels skill-acquisition dynamics: initial rapid progress followed by diminishing marginal improvements as mastery approaches. *Second,* we identify an "infrastructure-service lag", wherein technical infrastructure (TII) investments precede online service development (OSI). Vietnam exemplifies this pattern, with a TII CAGR of +3.6% compared to an OSI CAGR of +5.2%, indicating that service deployment is converging with established infrastructure capacity. This resembles construction sequencing: foundational and structural elements must precede interior finishing. *Third,* we encounter a persistent "human capital bottleneck" - human capital indices (HCI) consistently demonstrate the slowest improvement rates across all metrics. Even Vietnam, despite its robust momentum, achieves only an HCI CAGR of +2.8%. This

constraint reflects the inherent complexity of enhancing digital competencies and transforming cognitive frameworks across millions of individuals and processes, which cannot be accelerated solely through financial investment or technological deployment.

Furthermore, data analysis reveals critical "threshold effects" that nations must surmount. *The first threshold,* "digital service threshold", occurs at OSI = 0.8, corresponding to approximately 80% of public services achieving Level 3 - 4 maturity. Once this threshold is crossed, countries experience a dramatic acceleration in user adoption. Singapore (OSI 0.89), Korea (0.93), and Estonia (1.0) have transcended this threshold, achieving digital service utilization rates exceeding 85%. Conversely, Vietnam, with OSI 0.68, remains within the "chasm"-the adoption gap between early adopters and mainstream users. *The second threshold,* "infrastructure maturity point", emerges at TII = 0.85, representing 90% population access to high-speed internet and 70% stable 4G/5G mobile connectivity. Vietnam's TII of 0.71 indicates ongoing infrastructure deficits, which explain implementation challenges for sophisticated digital services. *The third and most formidable threshold,* "human capital readiness", manifests at HCI = 0.8, corresponding to 85% of the population having basic digital literacy and 75% of civil servants having proficiency with digital tools. Only Estonia, South Korea, and Singapore have achieved this threshold. Vietnam's HCI of 0.68 suggests this will be the paramount challenge in the near term.

Qualitative analysis yields five fundamental principles of institutional design. *The first principle,* "Unified Leadership", characterizes all prosperous nations through robust coordinating agencies with cross-sectoral authority. Estonia maintains a Chief Information Officer reporting directly to the Prime Minister, Singapore operates GovTech with CEO-level authority, and South Korea employs the Ministry of Science and ICT with independent budgetary control. This resembles orchestral conducting, in which a conductor ensures harmonious ensemble performance. *The second principle,* "Agile Governance", emphasizes rapid adaptation to technological evolution. Singapore conducts digital strategy reviews every 18 months, while Estonia maintains mechanisms to modify regulations within 3-6 months of technological innovation. This contrasts sharply with traditional governance models operating on 5-10-year planning cycles. In the digital realm, rapid change demands prioritizing flexibility over stability. *The third principle,* "ecosystem approach", transcends a governmental focus to cultivate comprehensive ecosystems that encompass the private sector, academic institutions, and civil society. South Korea established the Digital New Deal Alliance with 200+ organizations, while Estonia's e-Residency program attracts 100,000+ global digital nomads. Ecosystem development facilitates risk distribution, innovation enhancement, and assurance of sustainability.

Consider Vietnam as a primary vessel preparing for a pivotal voyage. The nation stands at a historical juncture, transitioning from a four-tier to a two-tier administrative structure while simultaneously entering a new developmental epoch. This transformation parallels the concurrent restructuring of the vessel's architecture, along with upgrades to its propulsion systems and navigation apparatus. Though the challenges are formidable, the

opportunities are even more substantial, necessitating the following policy implications:

Firstly, a paradigmatic shift from administration to service provision. The fundamental reconceptualization of public administration's role constitutes the primary imperative. In this new era, the government must evolve from "administrative overseer" to "service provider", from "power nexus" to "connectivity platform". Analogous to Netflix's model, which does not own content but creates optimal platforms for user access, Vietnam's digital government must become the infrastructure enabling seamless citizen and enterprise access to services and opportunities.

Secondly, the implementation of the "triple breakthrough" strategy. Vietnam must pursue three parallel, rather than sequential, breakthroughs. *The institutional breakthrough* leverages the two-tier model to eliminate superfluous intermediary processes. Rather than documentation traversing four administrative levels, direct "hierarchical bypassing" from central to local levels becomes feasible, akin to replacing slow elevators with high-speed variants that are not only faster but also more reliable. *The technological breakthrough* employs "leapfrogging" strategies, similar to those of African nations that bypassed landline infrastructure in favor of mobile telephony. Vietnam can skip the digitization phase and go directly to digital transformation, designing inherently digital processes rather than converting paper documents to PDFs. *The human capital breakthrough* requires substantial investment in cultivating "digital mindsets" among both civil servants and citizens, representing not merely computer literacy but cognitive reorientation from "documentation" to "data", from "procedures" to "experience".

Thirdly, establishing an intelligent hub-and-spoke architecture. The new two-tier local governmental structure necessitates an intelligent "hub and spoke" model. The central government functions as the "hub" - serving as the data center, standards repository, and monitoring nexus. Provincial/municipal governments operate as "spokes", service delivery points customized to local characteristics. The critical component involves creating "intelligent routing", automated systems directing citizens' requests to appropriate processing centers without requiring citizens' knowledge of jurisdictional hierarchies.

Fourthly, implementing resource harmonization strategies. Vietnam must adopt a "triple synchronization" approach: temporal synchronization, standardization, uniformity, and objective alignment. Temporal synchronization requires simultaneous implementation across all 34 provinces/cities, preventing any jurisdiction from lagging and creating "digital divides". Standardization uniformity ensures consistent service quality from Tuyen Quang to Ca Mau. Objective alignment ensures a comprehensive understanding of the shared vision and individual roles among all civil servants from the central to the local levels.

Fifthly, deploying controlled experimental mechanisms. Rather than "big bang" implementation or excessive caution, Vietnam should employ "controlled experimentation". Select 5 - 7 provinces/cities representing diverse regional characteristics as "living laboratories". Conduct biannual assessments, adjustments, and scaling. The critical element

involves establishing rapid "feedback loops" rather than waiting 2-3 years for experiential learning.

Sixthly, strategic investment in digital citizenship development. While technological focus predominates, ultimate digital transformation success depends on citizens' readiness and capacity to utilize it. Vietnam requires comprehensive "digital citizenship" programs, from children learning to protect personal information online to elderly citizens receiving support for basic digital services. This parallels transportation infrastructure development, not merely constructing roads but educating citizens about traffic regulations.

5. Conclusion

Vietnam aspires to become a nation where every citizen possesses a "digital identity" from birth, where all public services operate under a "digital by default" paradigm, and where all policy decisions are fundamentally "data-driven". This vision represents not a distant aspiration but an entirely achievable objective, contingent upon immediate commencement with resolute commitment and methodologically sound approaches. Vietnam's success in this endeavor would not merely transform the lives of its 100 million citizens. However, it would establish the nation as a "lighthouse case" for other developing countries pursuing digital government transformation.

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