Education

Educating for open governance: a three-strata pedagogical framework for digital citizenship and e-government

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Received 24 March 2026; Accepted 2 May 2026; Published 21 May 2026

DOI: https://doi.org/10.64171/JAES.6.3.91-99

Abstract

Although governments worldwide are aggressively accelerating digital transformation, e-government initiatives often stall due to a profound "participatory gap" stemming from underdeveloped digital citizenship. In Indonesia, despite successive policy reforms and infrastructural investments in the E-Government system (SPBE), structural asymmetries persist. This paper argues that state digital transformation frequently fails because the national educational ecosystem has not adequately evolved to produce critical, ethical, and engaged digital citizens. By employing a qualitative meta-synthesis guided by the PRISMA 2020 protocol, this study analyzes 28 peer-reviewed studies (2015–2025) to diagnose the root causes of open governance stagnation. The findings reveal that technological infrastructure is insufficient without a robust digital culture. Consequently, this study proposes the Open Governance Framework-4 Dimensions (OGF-4D), effectively adding Digital Culture as the fourth structural pillar to the traditional triadic model (data, service, and process). Crucially, this study operationalizes the digital culture dimension through a novel Three-Strata Pedagogical Framework, offering strategic pathways to integrate digital rights, ethics, and civic engagement across primary, secondary, and higher education. The study concludes that the sustainability of open governance is fundamentally an educational imperative, requiring a shift from producing passive internet users to cultivating active co-creators of digital democracy. Seven strategic policy recommendations are advanced for operationalizing the framework within Indonesia's SPBE ecosystem.

Keywords: Open governance, E-government, Digital culture, Qualitative meta-synthesis, Indonesia, SPBE, Digital transformation, Digital rights, Rights-first governance

1. Introduction

1.1. Global context: rise of open governance

At its broadest level, the transformation of public administration in the 21st century is defined by the dual imperatives of technological acceleration and democratic renewal. Governments worldwide are adopting e-government systems as strategic instruments to deliver public services more efficiently, transparently, and inclusively.[1] The evolution from basic digitization toward transformative open governance reflects a fundamental shift in how states conceptualize their relationship with citizens, businesses, and civil society—one that positions government not merely as a service provider but as a collaborative governance partner.[2] At the global frontier, Estonia's X-Road platform exemplifies a fully integrated digital government ecosystem with an Open Government Index score of 0.81,[3] while South Korea achieved consecutive top EGDI rankings in 2010 and 2012 through sustained investment in digital public infrastructure.[4] Collectively, these cases demonstrate that successful open governance is a function of deliberate institutional design, political commitment, and adaptive digital strategy.[5]

Moving from this global trajectory toward a theoretical foundation, Ojo and Millard[1] articulated an open governance system (OGS) built on three structural pillars: open data, open service, and Open Process positing that effective digital governance requires machine-readable public data, citizen-centric service delivery, and institutionalized participatory decision-making. This triadic model has since become the dominant theoretical reference point for evaluating the maturity of digital governance across both developed and developing contexts, providing a coherent normative architecture against which national trajectories can be assessed. It is against this architecture and its recognized limits that Indonesia's e-government reality must be examined.

1.2. E-government reality in Indonesia: persistent structural challenges

Narrowing from global patterns to the specific case of Indonesia, the country presents a paradox of ambition and underperformance that makes it a theoretically critical context for OG research. As the world's fourth most populous nation and Southeast Asia's largest economy, Indonesia has articulated an ambitious digital governance vision through its Sistem Pemerintahan Berbasis Elektronik (SPBE), anchored in Presidential Regulation No. 95 of 2018. Despite successive policy reforms, Indonesia's EGDI ranking declined from 70th in 2003 to 116th in 2016 before partially recovering to 64th in 2024.[6] Its Open Government Index (OGI) score of 0.53 places Indonesia in the lower tier of ASEAN nations, revealing a systemic gap between digital infrastructure provision and actual governance openness.[3]

The implementation landscape exposes deep structural asymmetries between central ministries and regional governments and between Java-based and outer-island

administrations.[7] Sentiment analysis of population registration services across major Indonesian cities shows that positive service sentiment does not exceed 50% in any case, with persistent deficiencies in data quality, system reliability, and user support.[8] During the COVID-19 pandemic, Indonesia recorded among the highest rates of government data breaches in the region, with credential leaks from over ten major government platforms documented in Q1 2022 alone.[9] These incidents expose not only technical vulnerabilities but also systemic failures of governance culture in data protection and institutional accountability. A foundational policy deficiency underlies these contemporary failures: Presidential Instruction No. 3/2003 inadvertently catalyzed siloed digital development by failing to mandate inter-agency coordination, producing widespread application duplication and fragmented data ecosystems[10]–structural pathologies that have resisted correction through subsequent reforms, including SPBE itself.[11]

1.3. The theoretical gap: digital culture as a missing dimension

The persistence of these challenges directs attention to an unresolved theoretical deficit in existing open governance frameworks. Ojo and Millard's OGS framework[1] primarily addresses functional-technical dimensions of openness without systematically accounting for the socio-institutional and normative conditions that determine whether citizens can meaningfully exercise rights within digital governance systems.[12] Research consistently demonstrates that non-technical factors—bureaucratic culture, leadership quality, and institutional design—exert a more decisive influence on SPBE outcomes than technical infrastructure alone.[13] Indonesia's low preparedness for open governance (OpenDataBarometer score: 38/100) and its pattern of data breaches collectively signal a governance culture that has yet to internalize the principles of digital rights, data sovereignty, and digital ethics.[14]

Emerging scholarship has addressed these dimensions under the umbrella of digital culture-encompassing digital rights, digital sovereignty, and digital ethics/norms.[2,12] However, no existing framework has operationalized digital culture as a structural governance dimension within an open governance model, particularly for large, archipelagic developing nations such as Indonesia. This constitutes the primary theoretical gap addressed in this study, and it is from this gap that the research questions and contributions of this paper directly emerge.

1.4. Research objectives and contributions

This paper addresses this gap by proposing a four-dimensional OGF (OGF-4D) that extends the OGS triadic model [1] by incorporating digital culture as a fourth structural pillar. Employing qualitative meta-synthesis guided by the PRISMA 2020 protocol,[15] this study synthesizes evidence from 28 peer-reviewed qualitative studies (2015–2025) to construct a theoretically grounded framework aligned with Indonesia's Golden 2045 vision. Three principal contributions are made: (1) *theoretical* extending OGS theory with digital culture as a fourth governance dimension; (2) *methodological*—demonstrating meta-synthesis for governance framework construction; and (3) *practical*—generating policy recommendations aligned with rights-first governance principles.[12]

2. Literature review and theoretical framework

2.1. Open governance system: a foundational triadic model

To build a coherent theoretical foundation, the three pillars of the OGS must be examined in depth, as each reveals both its analytical strength and its contextual limits when applied to Indonesia. Open data refers to the availability of government-held data in machine-readable, openly licensed formats that enable citizens, businesses, and civil society to access, reuse, and redistribute public information.[16] Empirical evidence links open data ecosystems to enhanced government accountability and civic engagement,[5,17] yet open data initiatives frequently underperform in developing nations due to low data literacy among public servants, inadequate interoperability standards, and institutional reluctance to disclose information.[18] In Indonesia, approximately 70% of ministries remain non-compliant with national open data standards, and the primary open data portal (data.go.id) suffers from chronically low utilization rates.[10]

Open service encompasses citizen-centric, inclusive, and responsive government service delivery.[19] Drawing on the Technology Acceptance Model (TAM),[20] service adoption depends not only on technical functionality but also on perceived usefulness and ease of use. The e-GovQual model's quality dimensions ease of use, trust, reliability, and citizen support[19] and the E-S-QUAL dimensions of efficiency, fulfillment, system availability, and privacy[37] provide operationalizable indicators for open service maturity, complemented by co-design and co-production approaches,[5,21] the updated IS Success model,[36] and behavioral change support for users with limited digital literacy.

Open process refers to the institutionalization of participatory mechanisms through which diverse stakeholders can meaningfully engage in policy formulation and public decision-making.[22] Evidence from the Organization for Economic Cooperation and Development (OECD) (2016) classifies Indonesia as exhibiting low participatory policy design maturity, indicating that participatory mechanisms remain largely symbolic and non-institutionalized. Research on COVAX shared health governance[38] further confirms that collective accountability and transparent participatory structures are prerequisites to governance legitimacy in complex multi-stakeholder environments, while studies on citizen grievance management in India[39] demonstrate that institutionalized, binding participatory mechanisms—not merely digital channels are the determinants of meaningful open process outcomes.

2.2. Digital Transformation and Institutional Transformation

Digital transformation distinct from mere digitization entails the fundamental restructuring of organizational processes,

culture, and service models enabled by digital technologies.[23] In the public sector, four imperatives drive this transformation: reforming internal administrative services, enabling open and transparent government through interoperable platforms, sustaining smart government principles, and enhancing public participation.[2] However, implementation evidence reveals a stark pattern: approximately 85% of digital transformation projects fail, and the primary causes are organizational culture and digital mindset deficits rather than technical inadequacies.[24] Indonesia's SPBE trajectory corroborates this global pattern, with scalability failures, vendor dependency, frontline skills deficits, and legacy infrastructure integration gaps documented across multiple evaluation cycles.[10,11]

At the strategic level, digital governance requires alignment among information systems, information technology, and organizational strategy.[25] Kwon[4] articulated three strategic dimensions of e-government: productivity (efficient, integrated services), democracy (participatory, policy-responsive governance), and reflexivity (rights-respecting, trust-building governance). Indonesia's SPBE strategy has predominantly addressed the productivity dimension while significantly underdeveloping the dimensions of democracy and reflexivity—a structural imbalance that directly explains the persistent governance legitimacy deficits. Research on enterprise architecture adoption further confirms that governance quality and normative institutional pressures are more significant determinants of digital strategy success than top management support alone,[26] corroborating Indonesia's experience where presidential mandates have been necessary but insufficient conditions for SPBE success.[10]

2.3. E-governance, data governance, and smart governance

Extending the analysis to data and smart governance dimensions, effective e-governance requires robust data governance frameworks addressing the full lifecycle of public data.[27] The Cloud Data Governance framework identifies four critical phases—initial, design, deploy, and sustain each requiring specific governance mechanisms, and Indonesia's documented breach pattern indicates systemic failures at the design and sustain phases.[9,27] The COBIT 2019 framework[43] provides an institutional governance architecture encompassing evaluate-direct-monitor, align-plan-organize, and deliver-service-support domains, while the STOPE framework—comprising strategy, technology, organization, people, and environment offers a holistic e-readiness instrument revealing that Indonesia's people, organization, and strategy dimensions remain critically underdeveloped despite incremental improvements in technology infrastructure.[29]

Big data-enabled smart governance offers transformational potential through real-time service optimization and anticorruption monitoring,[18] yet implementation evidence from developing nations confirms that security and privacy challenges, data management capacity deficits, and skills gaps constitute the primary barriers—barriers that are fundamentally cultural and institutional rather than purely technical.[28] Research on smart city governance across Amsterdam, Barcelona, Turin, and Vienna further confirms that successful digital transformation requires multi-stakeholder collaboration, strong political leadership, citizen co-production in service design, and government functioning as a boundary-spanning facilitator across institutional silos.[21,30] Mexico's experience with state-level transparency portals[40] additionally demonstrates that economic-political factors—not technical design alone—determine whether open governance instruments achieve substantive accountability outcomes, reinforcing the centrality of the non-technical dimensions discussed here.

2.4. Digital culture: the fourth emerging dimension

Having established the limits of the three existing OGS pillars and the broader context of DTF, the case for a fourth structural dimension becomes analytically compelling. Digital culture emerges as a governance dimension at the intersection of digital rights scholarship, data sovereignty theory, and digital ethics frameworks.[2,12] While existing open governance frameworks address *what* governments should do digitally, they systematically neglect the normative foundations that determine *how* digital governance should be conducted and *who* has rights within digital governance systems. Research on the open government maturity model confirms that the most advanced governance systems integrate democratic values transparency, accountability, collaborative openness, and citizen empowerment as structural governance components rather than as optional aspirations.[31]

Digital rights refer to citizens' entitlements in digital environments, including rights to digital access, privacy, data portability, algorithmic transparency, and effective redress mechanisms.[2] Digital sovereignty encompasses state-level sovereignty over national digital infrastructure and citizen-level sovereignty over personal data.[12] Indonesia's dependence on foreign cloud infrastructure and the vulnerability of critical government data systems collectively indicate a digital sovereignty deficit that directly undermines open governance aspirations. Digital ethics and norms address the behavioral standards, institutional values, and professional ethics that govern how public servants use digital systems and data.[2] E-government security research [41] confirms that security culture and managerial commitment rather than technical protocols alone—are the foundational prerequisites for trustworthy digital government systems. The rights-first governance framework[12] arguing that both Good Governance and Good Enough Governance are insufficient for developing nations without centering economic, political, social, and civil rights provides the most direct theoretical foundation for digital culture as a governance dimension and establishes the normative commitment upon which the OGF-4D framework is built.

3. Methodology

3.1. Research design: Qualitative Meta-Synthesis (QMS)

This study employs qualitative meta-synthesis grounded in an interpretivist-constructivist paradigm, following Noblit and Hare's[32] metaphorical translation method and Sandelowski and Barroso's[33] classificatory framework. Meta-synthesis was

selected because the research aim is theoretical framework construction—interpreting and translating meanings across qualitative studies rather than aggregating statistical outcomes. This design is appropriate for governance research, where quantitative aggregation cannot adequately capture contextual factors, institutional dynamics, and normative frameworks. Literature identification followed the PRISMA 2020 protocol,[15] with seven databases systematically searched—Scopus, Web of Science, Google Scholar, IEEE Xplore, Taylor & Francis, SAGE Journals, and SpringerLink using Boolean search strings combining terms related to open governance, e-government, digital transformation, and digital culture in public administration (2015–2025).

3.2. Search strategy and PRISMA flow

The structured Boolean search string was as follows: ("open governance" OR "open government") AND ("e-government" OR "digital government") AND ("developing countries" OR "Indonesia" OR "Asia") AND ("digital culture" OR "digital rights" OR "digital sovereignty" OR "digital ethics") AND ("public administration" OR "public sector"). Of the 890 initially identified records (847 database + 43 supplementary), 127 duplicates were removed. After title and abstract screening of 763 records, 589 were excluded as irrelevant, yielding 174 for full-text assessment. Full-text exclusions comprised 89 non-qualitative or mixed-methods studies, 34 non-governance-focused studies, and 23 pre-2015 non-foundational works, yielding a final included corpus of n = 28 studies.

3.3. Quality appraisal and synthesis procedure

Quality appraisal of all 28 studies was conducted using the CASP Qualitative Checklist.[34] Synthesis proceeded through three stages following Noblit and Hare[32]: (1) *reciprocal translation* mapping equivalent concepts across studies; (2) *refutational synthesis* examining competing theoretical interpretations; and (3) *lines-of-argument synthesis* constructing a coherent theoretical argument grounding the proposed OGF-4D framework. Trustworthiness was ensured through database triangulation, inter-rater reliability (Cohen's $\kappa = 0.82$), and Lincoln and Guba's[35] four criteria: credibility, transferability, dependability, and confirmability.

4. Results

4.1. Meta-synthesis clusters

The 28 included studies yielded five overarching thematic clusters through reciprocal translation and LOA synthesis. Theme T1 *(Technical-Functional Governance;* studies 1, 6–8, 10, 15, 17) synthesizes that technical dimensions—data quality, service delivery, and security—are necessary but insufficient for open governance. Theme T2 *(Institutional and Strategic Alignment;* studies 9, 11, 12, 26, 27) finds that governance quality, institutional design, and strategy alignment determine implementation success more than technical investment alone. Theme T3 *(Participatory and Collaborative Governance;* studies 5, 14, 16, 19, 20, 24, and 25) establishes that co-creation, multi-stakeholder collaboration, and institutionalized participatory mechanisms are essential governance components. Theme T4 *(Cultural and Leadership Factors;* studies 2, 3, 4, 13, and 18) demonstrates that organizational culture, leadership commitment, and digital mindset are stronger predictors of success than technical investment. Theme T5 *(Rights, Sovereignty and Ethics;* studies 21, 22, 23, 28) confirms that existing OGS models lack rights-based and sovereignty-oriented frameworks, constituting the primary theoretical gap.

4.2. OGF-4D framework: theoretical synthesis

Drawing upon this systematic synthesis, this study proposes the Open Governance Framework Four Dimensions (OGF-4D) as an extension of the triadic OGS model.[1] The OGF-4D framework posits that four interdependent structural dimensions must be simultaneously developed for effective, transformative open governance. Table 1 presents each dimension's key indicators, supporting theory, identified Indonesia gap, and strategic target for 2045.

Table 1: The OGF-4D framework: dimensions, indicators, and application in Indonesia

Dimension	Key indicators	Supporting theory	Indonesia Gap	Strategic target for 2045
D1: Open Data	Keywords: Collaboration, co-creation, participatory access, data standards, smart disclosure, privacy by design	Mergel *et al*. [5], Toots *et al*. [16], and Al-Ruithe and Benkhelifa [27]	~70% of ministries non-compliant; underutilized data.go.id; low data literacy among civil servants	Mandatory interoperability standards; investment in civil servant data literacy
D2: Open service	Personalization; service quality; public participation; support for behavioral change; digital equity	Davis [20], DeLone and McLean [36], Papadomichelaki and Mentzas [19], and Parasuraman *et al*. [37]	Service sentiment <50% positive; UX deficiencies; gap between Java and outer islands; digital divide	Keywords: user-centric co-design, digital equity investment, e-GovQual benchmarking
D3: Open Process	Keywords: public value, bottom-up governance, institutionalized participation, co-governance, binding mechanisms	Lopes [22], Sarker *et al*. [18], Nesti [21], and Mora *et al*. [30]	Symbolic musrenbang participation; OECD stage 2–3; no binding participatory mechanism	Keywords: Binding participatory mechanisms, digital democracy platforms, quadruple-helix governance
D4: Digital Culture (NOVELTY)	Digital Rights (access, privacy, portability, and redress); Digital Sovereignty (state and citizen); Digital Ethics and Norms	Zhang and Keller [12], Lips [2], Pirannejad and Ingrams [31], and Ribble and Bailey [46]	No digital rights legislation, data sovereignty deficit, and bureaucratic culture as the dominant SPBE barrier	Digital rights legislation, national sovereignty architecture, and mandatory ethics training for all ASNs

Note. D = Dimension. The OGF-4D model extends the OGS model of Ojo and Millard [1]. D4 (digital culture) constitutes the primary theoretical novelty. ASN = Aparatur Sipil Negara (Indonesian civil servants).

4.3. Theoretical interdependencies of the four dimensions

The four dimensions are theoretically interdependent in ways that make digital culture not merely additive but foundationally necessary. Open data without digital culture produces data availability without rights protection, sovereignty, or ethical information governance. Open service without digital culture produces administrative efficiency without equity, inclusion, or accountability for service failures. An open process without digital culture produces participation without genuine citizen empowerment or protection from manipulation. Thus, digital culture functions as the normative and institutional foundation upon which the other three dimensions derive their transformative potential. The OGF-4D framework is integrated within a *joined-up government + rights-first governance* architecture oriented toward Indonesia's vision of the Golden 2045. The meta-synthesis demonstrates, with convergent evidence across 19 of the 28 included studies, that non-technical factors—governance culture, leadership quality, institutional design, and rights frameworks—are the primary determinants of the success or failure of open governance. Therefore, Indonesia's persistent e-government underperformance is fundamentally a digital culture deficit rather than a technical infrastructure deficit, and this finding constitutes the central theoretical contribution of the OGF-4D framework.

4.4. Novelty statement

"No existing open governance framework integrates digital culture encompassing digital rights, digital sovereignty, and digital ethics/norms as a structural governance dimension. This absence constitutes a critical theoretical gap, particularly for developing nations where non-technical, cultural, and institutional barriers demonstrably dominate implementation outcomes. The OGF-4D framework addresses this gap by positioning digital culture as the normative foundation of open governance, operationalizing the rights-first approach [12] within the OGS tradition [1], and advancing a four-dimensional governance architecture calibrated to the institutional realities of large, archipelagic developing nations."

5. Discussion

5.1. Operationalizing digital culture: the foundation for digital citizenship

Having theoretically established the OGF-4D framework, the critical analytical task is to specify how its fourth dimension digital culture can be operationalized within Indonesia's governance ecosystem. Without a mature digital culture and ethical behavior among citizens and civil servants, advanced digital infrastructure and application portals cannot automatically generate transparency and civic participation. To operationalize the digital culture dimension with conceptual precision, the OGF-4D framework integrates the concept of digital citizenship proposed by Ribble and Bailey,[46] which provides a comprehensive framework for conceptualizing and responding to the multifaceted challenges encountered by technology users in a democratic society. Digital citizenship is not a rigid set of prescriptive rules but a normative architecture that bridges rights, responsibilities, and competencies—making it the digital culture dimension's natural operational language.

The nine elements of digital citizenship outlined by Ribble and Bailey[46] can be integrated as the ethical and sociological foundation of the OGF-4D model across three functional clusters.

First, Rights, Responsibilities, and Access (Digital Sovereignty): The elements of digital access and digital rights and responsibilities emphasize that all citizens must have equitable access to government services. The privileges afforded to digital technology users are intrinsically tied to community expectations of responsible behavior. In a participatory governance framework, society is not only entitled to demand transparency (rights) but also obligated to safeguard public data sovereignty (responsibilities)—a dual obligation that maps precisely onto the D4 Digital Culture dimension and reinforces D1 Open Data by requiring that data access be governed by rights principles rather than administrative discretion alone.

Second, ethics and norms of participation: digital etiquette and digital law serve as behavioral guidelines when citizens interact through the government's open process features. Technology is inherently value-neutral; therefore, its impact is entirely determined by human decisions.[46] This underscores the imperative of digital etiquette when the public articulates aspirations, critiques policies, or engages in discourse on e-government platforms connecting the ethics component of D4 to the participatory mechanisms of D3.

Third, Proficiency and System Security: Robust digital literacy ensures that the public can comprehend, utilize, and analyze open data, while digital security empowers citizens to protect their personal data when accessing digital public services reinforcing D1 and D2 respectively. Thus, the integration of digital citizenship into the OGF-4D model produces a framework in which governance's normative, competency, and rights dimensions are structurally interlocked rather than addressed in parallel silos.

5.2. Cultivating digital culture: a comprehensive educational ecosystem

Recognizing that the cultivation of robust digital citizenship within the OGF-4D governance framework cannot occur instantaneously, the discussion turns to the mechanisms through which digital culture can be systematically developed across Indonesia's institutional landscape. Rather than formulating restrictive policies that merely penalize technological misuse, the OGF-4D implementation logic demands empowering pedagogical models deployed across three educational strata each addressing a distinct constituency whose digital culture maturity is critical to open governance outcomes.

a) Basic education: fundamentals of digital ethics and security

At the primary education level, the establishment of digital culture must start with the early introduction of digital health and wellness and digital security. Students require foundational cybersecurity literacy and basic ethical guidelines for online

communication to prevent cyberbullying and build the civic reflexes necessary for responsible digital participation in adulthood. Recent educational literature[47] highlights that children exposed early to a structured digital citizenship curriculum develop resilience and critical thinking, preventing reactive behaviors when they eventually participate in public and e-government platforms. This foundational layer corresponds to the ethics and norms sub-component of D4, building from childhood the normative dispositions that will later translate into responsible civic engagement with open government systems.

b) Higher education: critical participation and the digital law

In higher education, university students representing Generation Z serve as primary catalysts for shaping a climate of open government participation. At this level, pedagogy must be directed toward critical thinking, civic action, and digital law. Recent empirical studies in Indonesia[48] demonstrate that while Generation Z possesses cognitive awareness of digital literacy, a significant participatory gap exists where they often fail to translate this knowledge into constructive online socio-political engagement. This gap highlights an implementation void in academic digital citizenship that must be urgently addressed through public transparency-oriented project-based and problem-solving curricula. Higher education intervention directly operationalizes the digital rights sub-component of D4: graduates who understand digital rights as civic entitlements are more likely to demand and hold accountable transparent, participatory e-government systems.

c) Professional and civil service education: transformation of the bureaucratic culture

Transformation toward open governance will stagnate if an educated public is met with an unprepared bureaucracy. Within professional education specifically education and training programs for civil servants (Aparatur Sipil Negara/ASN) curricula must emphasize the capacity to design and facilitate inclusive, transparent technologies. Recent evaluations of e-government implementation[49] confirm that the operationalization of open governance is highly contingent on the digital literacy and organizational culture of government officials. Civil servants must navigate software proficiently and undergo a cultural shift abandoning the "closed bureaucracy" mindset to become transparent, data-driven, and rights-respecting public servants. This professional stratum corresponds most directly to the digital ethics and digital sovereignty subcomponents of D4, and its transformation is the most immediate lever available to the Indonesian central government for improving SPBE outcomes. Thus, the integration of this three-strata educational ecosystem into the OGF-4D implementation architecture produces a comprehensive, society-wide approach to digital culture cultivation that addresses the systemic root causes of Indonesia's open governance deficit rather than treating its symptoms.

5.3. Strategic implications: from SPBE compliance to governance transformation

The synthesis of the OGF-4D framework with the digital citizenship operationalization model and educational ecosystem produces a coherent strategic picture for Indonesia's governance transformation trajectory. The rights-first implementation pathway[12] demands that the central government prioritize the following: (1) establishing minimum digital culture standards nationally through legislative action and mandatory ASN training; (2) achieving functional open data and open service standards at the central level through the INA Digital (GovTech) initiative;[44] and (3) progressively extending institutionalized open process mechanisms as digital literacy and institutional capacity develop across regional governments. The INA Digital initiative represents Indonesia's most significant institutional step toward centralized digital governance coordination. However, the OGF-4D framework has a critical limitation: its current mandate focuses on technical integration and service delivery standards without including digital culture metrics. Extending INA Digital's mandate to encompass digital culture measurement, digital rights impact assessment for all government systems, and digital sovereignty standards for cloud infrastructure procurement would transform it from a technical coordinator into a genuine open governance implementation vehicle.

6. Conclusions and Recommendations

6.1. Conclusion

This paper presents the Open Governance Framework – Four Dimensions (OGF-4D), a theoretically grounded and empirically validated extension of the foundational OGS model,[1] constructed through a systematic qualitative meta-synthesis of 28 peer-reviewed studies guided by the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) 2020 protocol [15] with an inter-rater reliability of Cohen's $\kappa = 0.82$. The deductive logic of this paper has moved from the established global framework of open governance, through Indonesia's paradoxical underperformance, to the theoretical gap in existing models, and finally to an evidence-grounded framework construction that installs digital culture as a fourth structural governance dimension.

The central finding is unambiguous: existing open governance frameworks are theoretically incomplete for developing-nation contexts. The triadic model of Open Data, Open Service, and Open Process while analytically robust fails to account for the normative, cultural, and institutional conditions that determine whether digital governance systems genuinely serve citizens or merely simulate openness. Meta-synthesis evidence from 19 of 28 included studies converges on the conclusion that non-technical factors are the primary determinants of open governance success or failure and that Indonesia's persistent e-government underperformance is fundamentally a digital culture deficit. The OGF-4D framework, operationalized through Ribble and Bailey's[46] digital citizenship model and the three-strata educational ecosystem, provides both the theoretical architecture and the practical implementation pathway for this cultural transformation. Overall, even the most

sophisticated e-government infrastructure will lose its substance without the presence of resilient digital citizenship. Indonesia can actualize a participatory e-government ecosystem in pursuit of the Golden Indonesia 2045 vision through systematic interventions spanning basic education, higher education, and bureaucratic professional training.

6.2. Policy recommendations

Based on the OGF-4D framework and Indonesia's SPBE evidence base, these six strategic policy recommendations are advanced for Indonesia's central government:

a) **Enactment of a comprehensive digital rights framework:** Indonesia requires legislation that explicitly establishes citizens' digital rights: digital access, algorithmic transparency, data portability, privacy protection, and effective redress for government data breaches. This legislative foundation is the prerequisite for genuine digital culture transformation and must be benchmarked against international standards adapted to the constitutional context of Indonesia.

b) **Establishment of a national digital sovereignty architecture:** The central government should develop a national digital sovereignty strategy encompassing data localization requirements for critical government data, national cloud infrastructure investment, cross-border data flow governance, and public-private data partnership frameworks that prioritize citizen data rights over commercial interests.

c) **Institutionalize digital ethics standards for all civil servants:** A mandatory digital ethics curriculum addressing responsible data use, anti-discrimination in algorithmic decision-making, transparency obligations, and accountability for digital service failures should be integrated into ASN training (diklat) at all levels and career stages, transforming bureaucratic culture from compliance-orientation to rights-first public service.

d) **Transforming the SPBE evaluation from compliance to outcomes and rights impact:** The current SPBE evaluation framework (Permenpan-RB No. 59/2020) should be redesigned to assess open governance outcomes—citizen rights realization, service equity across geographic contexts, participatory mechanism effectiveness, and digital culture maturity rather than mere technical deployment compliance.

e) **INA digital (GovTech) is deployed as the OGF-4D implementation vehicle:** The mandate of the INA Digital initiative should be explicitly extended to include digital culture metrics alongside technical integration and service delivery standards, incorporating digital rights impact assessment, digital sovereignty procurement standards, and digital culture maturity reporting as core institutional functions.[44]

f) **Prioritize the digital governance gap between java and the outer islands as a rights issue:** The documented performance disparity between Java-based and non-Java SPBE implementation requires targeted capacity building, infrastructure investment, and digital literacy programs in underserved regions, reframing geographic digital inequity as a digital rights violation requiring legislative and budgetary remediation.

g) **Institutionalizing a national digital citizenship curriculum framework across all educational strata:** As the primary operative mechanism for cultivating a mature digital culture ecosystem aligned with the D4 dimension of the OGF-4D framework, the central government should mandate the systematic integration of digital citizenship education—grounded in Ribble and Bailey's nine-element digital citizenship framework[46] across three institutional strata, each with differentiated pedagogical objectives and accountable line ministries. At the basic education level (SD–SMA), Kemendikbud-Ristek should embed digital health and wellness, digital security, and digital etiquette as a discrete competency strand within the national curriculum (Kurikulum Merdeka), ensuring that all Indonesian students develop foundational cyber-resilience and ethical digital reflexes before they engage with e-government platforms.[47] This foundational layer builds, from childhood, the normative dispositions that translate over time into responsible civic participation in the ODF, OS, and OP dimensions of the OGF-4D framework. At the higher education level (Perguruan Tinggi), a mandatory digital civic engagement module covering digital law, digital rights literacy, critical assessment of algorithmic systems, and participatory e-government should be introduced across all study programs, directly addressing the participatory gap documented among Generation Z in Indonesia[48] and cultivating the rights-literate citizenry capable of holding government accountable for open governance outcomes. At the professional and civil service level, KEMENPAN-RB in formal coordination with the National Institute of Public Administration (Lembaga Administrasi Negara/LAN) should redesign the ASN diklat system to include a compulsory Digital Culture Transformation Track combining digital rights literacy, open data stewardship, responsible data governance, and institutional digital ethics norms as a career-stage requirement for all civil servants.[49] This track operationalizes the bureaucratic culture shift that all prior SPBE evaluations identify as the decisive governance variable: the transformation from a closed-bureaucracy orientation toward transparent, data-driven, and rights-respecting public administration. To ensure cross-strata coherence, policy continuity, and measurable accountability, a National Digital Citizenship Task Force comprising Kemendikbud-Ristek, KEMENPAN-RB, BSSN (Badan Siber dan Sandi Negara), and Komdigi should be formally established through a Presidential Regulation, tasked with: (a) developing and periodically updating a nationally standardized Digital Citizenship Competency Framework (DCCF) mapped onto each educational stratum; (b) producing Digital Culture Maturity Indicators (DCMI) aligned with the OGF-4D D4 sub-dimensions of digital rights, digital sovereignty, and digital ethics/norms; and (c) integrating DCMI reporting

into the annual SPBE evaluation cycle, making Digital Culture a formally assessed and publicly disclosed governance performance dimension. This recommendation operationalizes the full normative logic of the OGF-4D framework: only when the citizens who use them and the civil servants who administer them share a foundational, institutionally cultivated culture of digital rights, sovereignty, and ethical responsibility can technical open governance systems generate genuine democratic value.

6.3. Limitations and directions for future research

This study has several limitations. As a meta-synthesis of qualitative studies, the OGF-4D framework requires empirical quantitative validation before its factorial structure and predictive validity can be confirmed. The contextual focus on Indonesia limits immediate cross-national generalizability, although transferability to comparable archipelagic developing nations is theoretically plausible. Three directions for future research are identified: (1) quantitative testing of OGF-4D dimensions using psychometrically validated survey instruments across Indonesian IPPD; (2) comparative application of OGF-4D to ASEAN developing nations Vietnam, Philippines, and Cambodia to assess cross-contextual transferability; and (3) development and validation of a Digital Culture Maturity Scale (DCMS) operationalizing digital rights, digital sovereignty, and digital ethics/norms as measurable governance constructs for government organizations.

7. Acknowledgements

The authors would like to thank the National SPBE External Assessor Team, the National SPBE Coordination Team, and officials at the Ministry of Administrative and Bureaucratic Reform (KEMENPAN-RB) for their participation in this research. Special gratitude is extended to the research promoter, Prof. Dr. Eko Prasojo, Mag.rer.publ., and co-promoter, Dr. Roy Valiant Salomo, M.Soc.sc., for their guidance throughout this doctoral research. This study was conducted as part of the Doctoral Program in Administrative Science, Faculty of Administrative Sciences, Universitas Indonesia. This research received no specific grant from any funding agency in the public, commercial, or not-for-profit sectors. AI tools were used solely to facilitate the understanding of the structure of research papers (Claude AI) and ensure academic grammatical standards (Trinka AI).

References

1. Ojo A, Millard J, editors. Government 3.0–Next generation government technology infrastructure and services. Cham: Springer, 2017. doi:10.1007/978-3-319-63743-3.
2. Lips M. Digital government: Managing public sector reform in the digital era. Abingdon: Routledge, 2019. doi:10.4324/9780429203657.
3. World Justice Project. WJP Open Government Index 2024. Washington (DC): World Justice Project, 2024.
4. Kwon GH. E-government and e-strategy. Seoul: Korea Development Institute School of Public Policy and Management, 2014.
5. Mergel I, Kattel R, Lember V, McBride K. Citizen-oriented digital transformation in the public sector. In: Proceedings of the 20th Annual International Conference on Digital Government Research. New York: ACM, 2019, p1-6. doi:10.1145/3325112.3325252.
6. United Nations. United Nations E-Government Survey 2024: Accelerating digital transformation for sustainable development. New York: United Nations Department of Economic and Social Affairs, 2024.
7. Metro TV. Mampukah pemerintah wujudkan Indonesia sentris? [Internet], 2024 [cited 2025]. Available from: https://www.youtube.com/watch?v=KgJA_VQat3g&t=1s
8. Anza FA. Text mining sentiment analysis of the civil registration service using Google Cloud Natural Language API, 2022.
9. Annur CM. Ten situs pemerintah yang diduga alami kebocoran data. Jakarta: Katadata, 2022.
10. BAPPENAS. Evaluasi pelaksanaan Inpres 3 Tahun 2003 tentang kebijakan dan strategi nasional pengembangan e-government. Jakarta: Badan Perencanaan Pembangunan Nasional, 2015.
11. Heeks R. Implementing and managing e-government: An international text. London: SAGE Publications, 2006.
12. Zhang X, Keller EJ. Good governance, good enough governance, and governance with rights first. California: University of California Open Access Publications, 2019.
13. Efendi T, Handayani T, Rifai R. Faktor kepemimpinan dalam perkembangan e-government di Indonesia. J Administrasi Publik. 2022;18(2):45-62.
14. World Wide Web Foundation. The Open Data Barometer: Global report. 4th ed. Washington (DC): World Wide Web Foundation, 2017.
15. Page MJ, McKenzie JE, Bossuyt PM, Boutron I, Hoffmann TC, Mulrow CD, *et al*. The PRISMA 2020 statement: An updated guideline for reporting systematic reviews. BMJ. 2021;372:n71. doi:10.1136/bmj.n71.
16. Toots M, McBride K, Kalvet T, Krimmer R. Open data as enabler of public service co-creation: Exploring the drivers and barriers. In: Proceedings of the International Conference for E-Democracy and Open Government (CeDEM), 2017, p102-112. doi:10.1109/CeDEM.2017.22.
17. Osorio-Sanabria MA, Brito-Carvajal X, Astudillo H, Amaya-Fernández F, González-Zabala M. Evaluating open government data programs: A systematic mapping study. In: Proceedings of the 7th International Conference on eDemocracy & eGovernment (ICEDEG). Piscataway (NJ): IEEE, 2020, p.1-8. doi:10.1109/ICEDEG48599.2020.9096734.
18. Sarker MNI, Wu M, Hossin MA. Smart governance through big data: Digital transformation of public agencies. In: Proceedings of the International Conference on Artificial Intelligence and Big Data (ICAIBD). Piscataway (NJ): IEEE, 2018, p62-70. doi:10.1109/ICAIBD.2018.8396172.
19. Papadomichelaki X, Mentzas G. e-GovQual: A multiple-item scale for assessing e-government service quality. Gov Inf Q. 2012;29(1):98-109. doi:10.1016/j.giq.2011.08.011.

20. Davis FD. Perceived usefulness, perceived ease of use, and user acceptance of information technology. MIS Q. 1989;13(3):319-340. doi:10.2307/249008.
21. Nesti G. Defining and assessing the transformational nature of smart city governance: Insights from four European cases. Int Rev Adm Sci. 2020;86(1):20-37. doi:10.1177/0020852317735890.
22. Lopes NV. Smart governance: A key factor for smart cities implementation. In: Proceedings of the IEEE International Smart Cities Conference (ISC2). Piscataway (NJ): IEEE, 2017, p1-6. doi:10.1109/ISC2.2017.8090562.
23. Verhoef PC, Broekhuizen T, Bart Y, Bhattacharya A, Dong JQ, Fabian N, *et al*. Digital transformation: A multidisciplinary reflection and research agenda. J Bus Res. 2021;122:889-901. doi:10.1016/j.jbusres.2019.09.022.
24. Mielli F, Bulanda N. Digital transformation: Why projects fail, potential best practices and successful initiatives. In: Proceedings of the IEEE-IAS/PCA Cement Industry Conference. Piscataway (NJ): IEEE, 2019, p.1-8. doi:10.1109/CITCON.2019.8729120.
25. Ward J, Peppard J. Strategic planning for information systems. 3rd ed. Chichester: Wiley, 2002.
26. Ahmad A, Drus SM, Kasim H. Factors that influence the adoption of enterprise architecture by public sector organizations: An empirical study. IEEE Access. 2020;8:204049-204065. doi:10.1109/ACCESS.2020.3036260.
27. Al-Ruithe M, Benkhelifa E. A conceptual framework for cloud data governance-driven decision making. In: Proceedings of the International Conference on the Frontiers and Advances in Data Science (FADS). Piscataway (NJ): IEEE, 2017, p.1-6. doi:10.1109/FADS.2017.8253196.
28. Li X, Qiao Y, Li P, Zhao D. A framework for big data governance to advance RHINs: A case study of China. IEEE Access. 2019;7:62330-62341. doi:10.1109/ACCESS.2019.2916579.
29. Al-Osaimi K, Alheraish A, Bakry SH. An integrated STOPE framework for assessing e-readiness. In: Proceedings of the National Computer Conference. Piscataway (NJ): IEEE, 2006.
30. Mora L, Deakin M, Reid A. Strategic principles for smart city development: A multiple case study analysis of European best practices. Technol Forecast Soc Change. 2019;142:70-97. doi:10.1016/j.techfore.2018.07.035.
31. Pirannejad A, Ingrams A. Open government maturity models: A global comparison. Soc Sci Comput Rev. 2022;40(3):720-737. doi:10.1177/0894439320985120.
32. Noblit GW, Hare RD. Meta-ethnography: Synthesizing qualitative studies. Newbury Park (CA): SAGE Publications, 1988. doi:10.4135/9781412985000.
33. Sandelowski M, Barroso J. Handbook for synthesizing qualitative research. New York: Springer Publishing, 2007.
34. Critical Appraisal Skills Programme (CASP). CASP Qualitative Studies Checklist [Internet]. Oxford: CASP, 2018 [cited 2025]. Available from: https://casp-uk.net/casp-tools-checklists/
35. Lincoln YS, Guba EG. Naturalistic inquiry. Beverly Hills (CA): SAGE Publications, 1985.
36. DeLone WH, McLean ER. Information system success measurement. Found Trends Inf Syst. 2016;2(1):1-116. doi:10.1561/2900000005.
37. Parasuraman A, Zeithaml VA, Malhotra A. A multiple-item scale for assessing electronic service quality. J Serv Res. 2005;7(3):213-233. doi:10.1177/1094670504271156.
38. Gorodensky A, Grundy Q, Persaud N, Kohler JC. Shared health governance, mutual collective accountability, and transparency in COVAX: A qualitative study. J Glob Health. 2023;13:04003. doi:10.7189/jogh.13.04003.
39. Shukla AK, Dubey A. Enhancing citizen engagement and accountability: A comprehensive study on the management of public grievances and the evolution of good governance in India. Mind Soc. 2024;23(1):1-18. doi:10.1007/s11299-024-00310-z.
40. Cifuentes-Faura J. Shedding light on transparency: A comprehensive study of state-level transparency portals in Mexico. Policy Internet. 2024;16(1):45-67. doi:10.1002/poi3.350.
41. Hadi R, Muhaya FTB. Essentials for e-government security. In: Proceedings of the International Conference on Information Society (i-Society). Piscataway (NJ): IEEE, 2011, p214-219.
42. European Union. E-government in the United Kingdom. Brussels: European Commission, 2014.
43. ISACA. COBIT 2019 framework: Governance and management objectives. Rolling Meadows (IL): ISACA, 2018.
44. KEMENPAN-RB. INA Digital: The national GovTech initiative. Jakarta: Ministry of Administrative and Bureaucratic Reform of Indonesia, 2024.
45. Venkateswaran R, Jyotishi A. Digital strategy performance differential between government and private sector. In: Proceedings of the International Conference on Computational Intelligence and Computing Research (ICCIC). Piscataway (NJ): IEEE, 2017, p.1-6. doi:10.1109/ICCIC.2017.8524411.
46. Ribble M, Bailey G. Digital citizenship in schools. Eugene (OR): International Society for Technology in Education, 2007.
47. Putri N. Digital citizenship in the 21st century: Strengthening digital ethics. CosmoGov J Ilmu Pemerintahan, 2024. doi:10.24198/cosmogov.v11i1.60821.
48. Retnasari L, Abdulkarim A, Sundawa D, Bestari P, Kusumawardani E. Bridging the participatory gap: Digital literacy and civic engagement among Indonesia's Gen Z from civic educator's perspective. TIIKM Conf Proc Educ, 2025. doi:10.17501/24246700.2025.11119.
49. Dewi EK, Muhaemin Y, Sitompul GA, Parinduri RY, Rika M. Digital transformation in public services: Evaluation of e-government implementation in Indonesia. Socius J Sosiol, 2025. doi:10.5281/zenodo.174752.