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Digital Government for Sustainable Development: An Integrative Systematic Literature Review of Citizen Readiness, Governance Dynamics, and Public Value Co-Creation

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ABSTRACT

Digital government is increasingly positioned as a strategic instrument for sustainable development, yet the literature remains fragmented across adoption, inclusion, governance capacity, participation, public value, and sustainability debates. This article addresses that fragmentation through an integrative systematic literature review of 297 Scopus-indexed journal articles and reviews published between 2015 and 2025. Using PRISMA-informed screening, relevance appraisal, descriptive mapping, thematic coding, and conceptual synthesis, the review examines how digital government research conceptualizes citizen readiness, governance dynamics, public value co-creation, and sustainable public value outcomes. The findings indicate a broadening of the literature from a predominant focus on e-government adoption and administrative efficiency toward greater attention to citizen capacity, institutional responsiveness, participation, and sustainable public value. However, six persistent gaps remain: adoption bias, weak citizen agency, static governance capacity, fragmented sustainability claims, tokenistic participation, and limited full-cycle co-creation. To address these gaps, the article proposes the DR–GD–PVCC–SPV framework as a theory-building synthesis that integrates digital readiness of citizens, governance dynamics, public value co-creation, and sustainable public value. The framework positions citizen readiness as a potential capacity for agency, governance dynamics as a meso-level institutional process, and co-design, co-implementation, and co-evaluation as analytically distinct forms of public value co-creation. The relationships among these constructs are proposed for subsequent empirical examination rather than treated as established causal, mediating, or moderating effects. The article contributes by reframing sustainability as a multidimensional public-value concern rather than an automatic outcome of digitalization and provides an integrative framework for future empirical testing and public-sector evaluation.

1. INTRODUCTION

Digital government has become a central governance instrument for advancing sustainable development. Across national and local contexts, governments increasingly deploy digital platforms, integrated service portals, mobile applications, data infrastructures, artificial intelligence, and participatory technologies to improve service delivery, administrative coordination, transparency, and citizen engagement. This transformation reflects a shift from earlier e-government models, which mainly emphasized online service provision and efficiency, toward digital government as a socio-technical transformation of public institutions, service ecosystems, and state-citizen relations [1, 2]. In this broader understanding, digital government is not only a modernization project. It is a governance project through which public institutions seek to produce inclusive, accountable, responsive, and sustainable public value [3, 4].

The relationship between digital government and sustainable development has become increasingly explicit in global policy discourse. The United Nations E-Government Survey positions digital transformation as a pathway for accelerating sustainable development through inclusive services, stronger local e-government, and digitally enabled institutions [5]. The OECD Digital Government Policy Framework similarly argues that mature digital government requires governments to become digital by design, data-driven, open by default, proactive, user-driven, and organized as platforms [6, 7]. The World Bank's GovTech framework also emphasizes core government systems, online public service delivery, digital citizen engagement, and institutional enablers [8]. These frameworks indicate that digital government should be assessed not only by technological adoption, platform maturity, or service availability, but also by inclusion, equity, accountability, trust, resilience, and citizen empowerment.

However, the sustainability promise of digital government is neither automatic nor evenly distributed. Digital services may reduce transaction costs, expand access, improve responsiveness, and support data-informed decisions. Yet they

may also reproduce exclusion when citizens lack stable connectivity, appropriate devices, digital literacy, trust, or the capacity to use digital systems meaningfully. Digital divide research shows that inequality is no longer limited to physical internet access; it also involves material access, skills, usage patterns, and unequal outcomes [9]. Citizens may be formally connected to digital services but practically excluded from their benefits. A sustainable digital government agenda must therefore move beyond infrastructure provision and service digitization toward citizen readiness.

In this article, citizen readiness refers to the multidimensional capacity that enables citizens not only to access and use digital public services, but also to engage in their design, implementation, evaluation, and improvement. It includes access, literacy, perceived usefulness, trust, privacy and security perceptions, motivation, empowerment, and institutional support. This distinction matters because digital government research has often treated citizens as users, adopters, consumers, or beneficiaries rather than as co-creators of public value [10, 11]. A citizen may use an online service because it is mandatory or convenient, yet still have no influence over how the service is designed or improved.

A second limitation concerns governance dynamics. In this article, governance dynamics refers to the adaptive and interactive processes through which public actors activate stakeholders, frame collective problems, mobilize institutional resources, coordinate service ecosystems, and interpret, coordinate, and potentially incorporate citizen input into service improvement and institutional learning. Existing digital government scholarship identifies leadership, regulatory clarity, inter-agency coordination, data governance, organizational learning, frontline capacity, stakeholder collaboration, and feedback mechanisms as relevant institutional conditions for digital transformation [1, 2]. Yet these conditions are often discussed separately, with limited attention to how they may operate as interconnected institutional processes shaping whether and how citizens' digital readiness is recognized, coordinated, and associated with substantive public value co-creation.

Public value co-creation provides the theoretical bridge between digital government and sustainable development. Public service research argues that value is not generated solely through government provision, but through interactions among public organizations, citizens, communities, and other stakeholders [12, 13]. In digital government, co-creation occurs when citizens participate in identifying service needs, shaping service design, supporting implementation, evaluating performance, and pushing governments toward continuous improvement. Digital technologies can support such interaction, but they can also depersonalize services, bypass citizen interaction, or create new forms of exclusion [14]. The key issue is therefore whether governance systems enable meaningful citizen influence.

Existing scholarship remains fragmented. One stream focuses on adoption, acceptance, satisfaction, continuance intention, usability, and service quality. A second examines digital divide, literacy, accessibility, cybersecurity, privacy, and trust. A third addresses smart governance, platform governance, institutional capacity, data governance, and public sector transformation. A fourth explores citizen participation, e-participation, co-production, and co-creation. A fifth links digital government to sustainability and the Sustainable Development Goals. Existing reviews have advanced understanding of public value in e-government, public value creation in digital government, and the role of digital technologies in co-production [3, 4, 14]. Yet an integrative account of how citizen capacities, institutional processes, participatory arrangements, and sustainable public value may relate to one another remains underdeveloped. In particular, the literature rarely brings these dimensions together within a common analytical structure while preserving their conceptual distinctions and avoiding the assumption of a predetermined causal sequence.

This article addresses that gap through an integrative systematic literature review of digital government scholarship. It asks: How are sustainable development outcomes conceptualized and linked to digital government? What dimensions of citizen readiness are emphasized? How are governance dynamics conceptualized in relation to citizen participation and public value co-creation? How can citizen readiness, governance dynamics, and public value co-creation be integrated into a framework for sustainable digital government? The article makes four contributions. It reframes digital government as a sustainability-oriented public value project, conceptualizes citizen readiness as a multidimensional capacity for potential agency, positions governance dynamics as a proposed meso-level institutional process lens, distinguishes substantive public value co-creation from limited or tokenistic forms of digital participation, and develops the DR–GD–PVCC–SPV (digital readiness of citizens, governance dynamics, public value co-creation, and sustainable public value) framework as a theory-building synthesis of theoretically plausible relationships among citizen capacity, institutional processes, participatory value formation, and sustainable public value. The framework is intended to organize and guide subsequent empirical examination rather than to establish causal, mediating, or moderating relationships from the review itself.

The article therefore deliberately avoids treating digital government as a single administrative innovation. It approaches the field as a contested governance space in which technology, citizen capacity, institutional responsiveness, and public value are potentially interrelated. This perspective is particularly important because governments increasingly claim that digital transformation advances sustainability, yet empirical and conceptual evidence suggests that such claims should be examined in relation to the conditions under which citizens can participate meaningfully and institutions can respond to and learn from citizen input. Limited citizen readiness may constrain meaningful engagement with digital public services; weak or fragmented institutional processes may restrict how citizen input is recognized and incorporated; and participation may remain symbolic when citizens have little substantive influence over service design, implementation, or evaluation. These relationships are treated as theoretically plausible conditions for subsequent empirical examination rather than as predetermined causal effects.

The review is structured to support this integrative inquiry. The conceptual background clarifies the core constructs. The methodology explains the integrative review design, search strategy, appraisal, and coding procedures. The findings synthesize publication trends, thematic clusters, and missing links. The integrative framework then brings citizen readiness, governance dynamics, public value co-creation, and sustainable public value into a common theory-building structure and proposes theoretically plausible relationships among them for subsequent empirical examination. The discussion and implications identify theoretical,

methodological, and practical consequences for digital government research and public sector reform.

The focus on sustainable public value is also important for local and developing-country contexts, where digital transformation is often pursued under conditions of uneven infrastructure, unequal citizen capabilities, limited administrative coordination, and contested public trust. In such settings, digital government should not be evaluated solely through national maturity rankings or platform expansion. Its evaluation should also consider the everyday capacity of citizens to access services, the ability of institutions to respond to feedback, and the extent to which digital reforms are associated with greater inclusion or, conversely, with the reproduction of existing forms of exclusion. These concerns strengthen the theoretical and practical case for examining citizen readiness, governance dynamics, public value co-creation, and sustainable public value within a common analytical framework.

This positioning also clarifies the role of the empirical corpus. The review does not treat the 297 records merely as a bibliographic inventory; rather, it uses the systematically appraised and coded corpus to develop an evidence-informed, theory-building synthesis of recurring conceptual relationships and gaps. The tables, figures, and supplementary materials serve as reporting and audit devices that document corpus construction, analytical weighting, thematic coding, and the evidence-to-concept progression underlying the proposed framework. The bibliometric visualizations provide descriptive context, whereas the article-level thematic synthesis constitutes the principal evidence base for identifying conceptual fragmentation and developing the proposed theory-building relationships.

2. CONCEPTUAL BACKGROUND

This section develops the conceptual foundation for an integrative review of digital government for sustainable development. Rather than treating digital government, citizen readiness, governance dynamics, and public value co-creation as separate concepts, it examines citizen readiness, governance dynamics, public value co-creation, and sustainable public value as analytically distinct but potentially interrelated dimensions within the broader socio-technical context of digital government.

The central premise is that sustainable digital government should not be evaluated through technology adoption alone. Its analysis requires attention to citizens' capacities to engage with digital public services, the institutional processes through which such engagement may be recognized and coordinated, the forms of participation through which citizens may contribute to public value formation, and the sustainable public-value outcomes associated with digital transformation. The relationships among these dimensions are treated as theoretically plausible and open to subsequent empirical examination rather than as a predetermined causal sequence.

2.1 Digital government beyond e-government

Digital government represents a more transformative stage of public sector digitalization than conventional e-government. While e-government has often been associated with putting administrative services online, digital government involves the reconfiguration of institutions, data infrastructures, service ecosystems, and state-citizen relations through digital technologies. Digital government therefore extends beyond the electronic conversion of existing bureaucratic procedures. It involves organizational redesign, data-driven decision-making, platform-based integration, user-centered service design, and new forms of interaction between citizens and public institutions [1, 2]. The OECD Digital Government Policy Framework captures this broader shift by identifying mature digital government as digital by design, data-driven, government as a platform, open by default, user-driven, and proactive [6]. Thus, digital government should be understood as a socio-technical governance transformation that changes how public value is defined, produced, delivered, and evaluated.

2.2 Sustainable development in digital government

Sustainable digital government refers to the capacity of digital public systems to generate inclusive, accountable, trusted, resilient, and continuously improved public value over time. This definition moves beyond the assumption that digitalization is inherently sustainable. Digital public services may increase efficiency, reduce transaction costs, accelerate service delivery, and expand access. However, they may also reproduce exclusion, intensify dependence on technical infrastructures, weaken trust, and marginalize citizens who lack adequate access, skills, or institutional support. The United Nations E-Government Survey 2024 positions digital transformation as an enabler of sustainable development, particularly through inclusive digital services, stronger local e-government, and digitally enabled public institutions [5]. Yet these contributions depend on whether digital systems produce public value that is socially inclusive, institutionally accountable, and responsive to lived needs [15]. Public value research therefore provides an analytical lens for evaluating sustainability in digital government [3, 4].

2.3 Citizen readiness

Citizen readiness is a multidimensional capacity that enables citizens not only to access and use digital public services, but also to exercise agency in shaping their design, implementation, evaluation, and improvement. It is broader than digital access and more relational than individual competence. Digital divide research shows that inequality has shifted from simple physical access to complex forms of material access, skills, usage patterns, and unequal outcomes [9].

In this article, citizen readiness consists of five dimensions. Access readiness refers to devices, connectivity, affordability, and accessible service channels. Skill readiness refers to digital literacy, procedural knowledge, and the ability to navigate platforms. Trust readiness concerns confidence in government, data protection, privacy, cybersecurity, and system reliability. Motivational readiness refers to perceived usefulness, willingness, and confidence. Participatory readiness refers to citizens' capacity to articulate needs, provide feedback, evaluate quality, and influence improvement. This perspective shifts the analytical focus from citizens as users to citizens as agents.

2.4 Governance dynamics

Governance dynamics refers to the adaptive and interactive

processes through which public actors activate stakeholders, frame collective problems, mobilize resources, coordinate service ecosystems, and interpret, coordinate, and potentially incorporate citizen input into service improvement and institutional learning. This concept differs from static notions of institutional capacity because it emphasizes interaction, adaptation, orchestration, and learning. It draws from adaptive and collaborative governance traditions that view public problem-solving as a multi-actor process involving negotiated authority, shared resources, and iterative adjustment [16, 17].

In this review, governance dynamics is conceptualized as a proposed meso-level institutional process lens that draws attention to how citizen-level capacities may be recognized, coordinated, and incorporated within broader governance arrangements. Citizens may possess access, skills, trust, and motivation, but the presence of these capacities does not necessarily result in substantive participation or public value co-creation; institutional arrangements may shape whether and how citizen capacities are expressed through credible participation channels, institutional responsiveness, and the treatment of citizen input in service-related decisions. Conversely, sophisticated platforms may coexist with limited citizen influence where coordination, feedback use, institutional responsiveness, or accountability remain weak.

Accordingly, governance dynamics is not treated in this review as an empirically verified mediating or causal mechanism. Rather, it provides a process-oriented analytical lens for examining activation, framing, mobilization, coordination, and feedback synthesis as institutional processes that may shape the relationship between citizen readiness and public value co-creation. The specific form, direction, and strength of these relationships remain questions for subsequent empirical examination.

2.5 Public value co-creation

Public value co-creation refers to the collaborative process through which public institutions, citizens, communities, service users, and stakeholders jointly contribute to defining, producing, implementing, evaluating, and improving public services. Co-creation builds on but extends co-production. Whereas co-production often emphasizes citizens' involvement in service delivery, co-creation captures broader value-generating interactions across the service lifecycle [12, 13]. A critical distinction is that digital participation is not automatically public value co-creation. Citizens may log into platforms, submit complaints, complete online forms, or provide ratings without meaningful influence over service priorities or institutional change. Digital technologies can support co-creation by expanding feedback channels and participatory platforms, but they may also depersonalize services, bypass interaction, or produce exclusion when governance arrangements are weak [11, 14]. This article conceptualizes co-creation through co-design, co-implementation, and co-evaluation, enabling the review to distinguish tokenistic interaction from meaningful public value creation.

Taken together, these concepts establish the theoretical basis for the review. Digital government provides the socio-technical setting; sustainable public value provides the broader evaluative outcome domain; citizen readiness captures citizens' multidimensional capacity for potential agency; governance dynamics provides a proposed meso-level institutional process lens for examining how citizen capacities may be recognized, coordinated, and connected with participatory processes; and public value co-creation describes the participatory domain through which citizens may contribute to defining, implementing, evaluating, and improving public services and public value.

Building on these distinctions, the framework developed in this article proposes that citizen readiness, governance dynamics, public value co-creation, and sustainable public value may be theoretically related, while leaving the direction, strength, and specific causal form of those relationships open to subsequent empirical examination. Citizen readiness is therefore treated as a potential capacity rather than realized influence; governance dynamics as an institutional process lens rather than a verified mediating mechanism; and co-design, co-implementation, and co-evaluation as analytically distinct forms of public value co-creation rather than as a mandatory linear sequence.

This integrative positioning also prevents conceptual reductionism. Digital government is not reduced to infrastructure, citizen readiness is not reduced to literacy, governance dynamics is not reduced to capacity, co-creation is not reduced to consultation, and sustainability is not reduced to efficiency. Each construct retains its analytical specificity while contributing to an integrative, theory-building account of sustainable digital government. The proposed relationships among these constructs are intended to organize future empirical inquiry rather than to imply that causal, mediating, or moderating effects have been established by the review.

3. METHODS

3.1 Review design

This study employed an integrative systematic literature review to synthesize and theorize the relationship among digital government, citizen readiness, governance dynamics, public value co-creation, and sustainable development. The design was selected because the article aims not only to map digital government scholarship, but also to integrate fragmented conceptual streams and develop an integrative conceptual framework that proposes theoretically plausible relationships among the focal constructs for future empirical examination. Systematic reviews are appropriate for identifying, appraising, and synthesizing a body of knowledge through transparent and reproducible procedures [18, 19]. Because the purpose of this article is conceptual integration rather than effect-size estimation or empirical testing of causal or mediating relationships, it follows an integrative review logic, which is suitable for fields characterized by theoretical fragmentation, methodological heterogeneity, and emerging debates [20, 21]. Accordingly, the relationships incorporated into the proposed framework are treated as theory-building propositions derived from the synthesis of the reviewed literature, rather than as empirically established causal mechanisms (see Table 1).

3.2 Data source and search strategy

Scopus was selected as the primary database because it provides broad multidisciplinary coverage across public administration, information systems, governance, sustainability, public policy, and social sciences. Although the use of a single database may exclude studies indexed

elsewhere, Scopus offers a consistent and high-quality corpus suitable for integrative synthesis. The dataset consisted of 297 Scopus-indexed records exported on April 25, 2026. The corpus covered publications from 2015 to 2025 and included 271 journal articles and 26 review articles. All records were written in English, and no duplicate DOI entries were identified. Full texts were consulted where titles, abstracts, keywords, and metadata provided insufficient information for relevance assessment or thematic coding.

Table 1. Review protocol

Protocol Item	Description
Review type	Integrative systematic literature review
Main objective	To synthesize digital government literature and develop an integrative conceptual framework proposing theoretically grounded relationships among citizen readiness, governance dynamics, public value co-creation, and sustainable development
Database	Scopus
Export date	April 25, 2026
Publication period	2015–2025
Document types	Journal articles and review articles
Language	English
Final review corpus	297 records retained after Scopus filtering from an initial search result of 1,896 records
Final use of corpus	Descriptive mapping, relevance assessment, thematic synthesis, and theory-building framework development.
Analytical stages	Descriptive mapping; conceptual mapping; thematic synthesis; integrative framework development
Reporting logic	PRISMA 2020-informed reporting and screening logic
Core concepts	Digital government; citizen readiness; governance dynamics; public value co-creation; sustainable development
Intended contribution	An integrative conceptual framework and a set of tentative theoretical propositions for explaining and subsequently testing how citizen readiness, governance dynamics, and public value co-creation may contribute to sustainable digital government

Note: The table summarizes the review design, database, publication period, document type, language, corpus size, and analytical stages used in the integrative systematic literature review.

The review was conceptually organized around four analytical domains: digital government, citizen-related dimensions, governance and co-creation, and sustainability, but these domains should be distinguished from the Boolean query actually used to retrieve records from Scopus. The final retrieval strategy consisted of two TITLE-ABS-KEY blocks connected by the Boolean operator AND. The first block captured core digital-government terminology, whereas the second combined sustainability-related terms with public value, digital inclusion, citizen participation, and co-creation terminology. The exact query used to construct the corpus was:

TITLE-ABS-KEY ("digital government" OR "e-government" OR "digital governance" OR "smart governance" OR "GovTech" OR "digital public service") AND TITLE-ABS-KEY ("sustainable development" OR sustainability OR "public value" OR "digital inclusion" OR "digital literacy" OR "digital divide" OR "citizen participation" OR "co-creation" OR "co-production" OR "e-participation").

Terms appearing in the broader conceptual framework but not in this final Boolean query including “citizen readiness,” “digital skills,” “trust,” “privacy,” “security,” “governance capacity,” “collaborative governance,” “public service innovation,” “SDGs,” “inclusive public service,” “accountability,” “equity,” and “resilience” are therefore not reported as database retrieval terms. Instead, where relevant, these concepts informed the subsequent relevance assessment, data extraction, and deductive–inductive thematic coding of the retrieved literature. This distinction separates the reproducible database search from the broader conceptual vocabulary used to interpret the corpus.

The initial Scopus search yielded 1,896 records. Sequential eligibility and database filters relating to publication period, document type, publication stage, journal source, language, and access status were subsequently applied as detailed in Sections 3.3–3.4 and Supplementary Material (Appendix B), resulting in the final corpus of 297 records. Supplementary Material (Appendix A) reports the exact retrieval query and distinguishes it from the broader analytical concepts used during subsequent synthesis.

3.3 Inclusion and exclusion criteria

The inclusion criteria were designed to ensure relevance, transparency, and replicability (see Table 2). Records were included when they were indexed in Scopus, published between 2015 and 2025, written in English, classified as journal articles or review articles, published in final form in journal sources, and identified as open access in Scopus at the time of retrieval. Topical scope at the retrieval stage was defined by the two-block TITLE-ABS-KEY query reported in Section 3.2 and Supplementary Material (Appendix A2). No additional undocumented substantive-exclusion step was applied after the database filters had produced the 297-record corpus. Instead, variation in the degree of digital-government, sustainability, public-value, and focal-construct relevance was evaluated subsequently through the structured post-retrieval relevance appraisal described in Section 3.5.

The open-access criterion was applied to ensure that full texts could be consulted when titles, abstracts, keywords, and metadata were insufficient for relevance assessment, methodological-transparency appraisal, or thematic coding. Open-access status was therefore treated as an accessibility criterion rather than an indicator of methodological quality. Because this restriction may underrepresent relevant subscription-based literature and may disproportionately capture journals with extensive open-access publishing, it constitutes a potential source of selection bias and is explicitly recognized as a boundary of the review corpus.

The focal constructs citizen readiness, governance dynamics, public value co-creation, and sustainable public value outcomes were not treated as four cumulative inclusion requirements. Rather, they were used after retrieval to assess conceptual relevance and to classify the contribution of each record during appraisal and thematic coding. Accordingly, a study was not excluded solely because it did not address every focal construct.

Conference papers, book chapters, editorials, notes, non-English records, non-journal sources, records without open-access availability under the applied Scopus filter, and studies lacking substantive public-governance or sustainability

relevance were excluded through the corpus-construction filters. Records differing in substantive public-governance, sustainability, public-value, or focal-construct relevance were not removed through an additional post-retrieval exclusion stage; these differences were captured through the relevance-classification procedure reported in Section 3.5.

Table 2. Inclusion and exclusion criteria

Criterion	Inclusion Criteria	Exclusion Criteria
Database	Scopus-indexed publications	Publications outside Scopus
Document type	Journal articles and review articles	Conference papers or abstracts, book chapters, editorials, notes, and other document types outside the article/review categories
Publication stage/source	Final publications in journal sources	Non-final publications or publications outside journal sources
Language	English	Non-English publications
Access status	Publications identified as open access through the Scopus filter at the time of retrieval, enabling full-text consultation where required for appraisal and coding	Records not meeting the open-access filter applied during corpus construction
Publication period	2015–2025	Publications outside the selected review period
Retrieval scope	Defined through the two-block TITLE-ABS-KEY query reported in Section 3.2 and Supplementary Material (Appendix A2)	No additional topical exclusion filter was applied after construction of the 297-record corpus; differences in substantive relevance were evaluated post retrieval.
Post-retrieval conceptual relevance	Digital-government, sustainability, public-value, and focal-construct relevance were assessed through the structured appraisal described in Section 3.5	Records were analytically weighted as highly relevant, relevant, moderately relevant, or supporting/background rather than excluded through a separate substantive-screening stage
Focal constructs used for analytical classification	Citizen readiness, governance dynamics, public value co-creation, and sustainable public value outcomes were used for relevance appraisal and thematic coding; individual records were not required to address all four constructs simultaneously.	Records were not excluded solely because one or more focal constructs were absent; such differences were captured through relevance classification

Note: The table distinguishes corpus-construction filters from post-retrieval analytical classification. Publication period, document type, publication stage, source type, language, and open-access status were applied as corpus-construction filters. The topical scope was defined by the retrieval query, whereas variation in substantive digital-government, sustainability, public-value, and focal-construct relevance was assessed after retrieval through the relevance-appraisal procedure described in Section 3.5. The post-retrieval appraisal assigned analytical weight to records and did not constitute an additional undocumented database-exclusion stage.

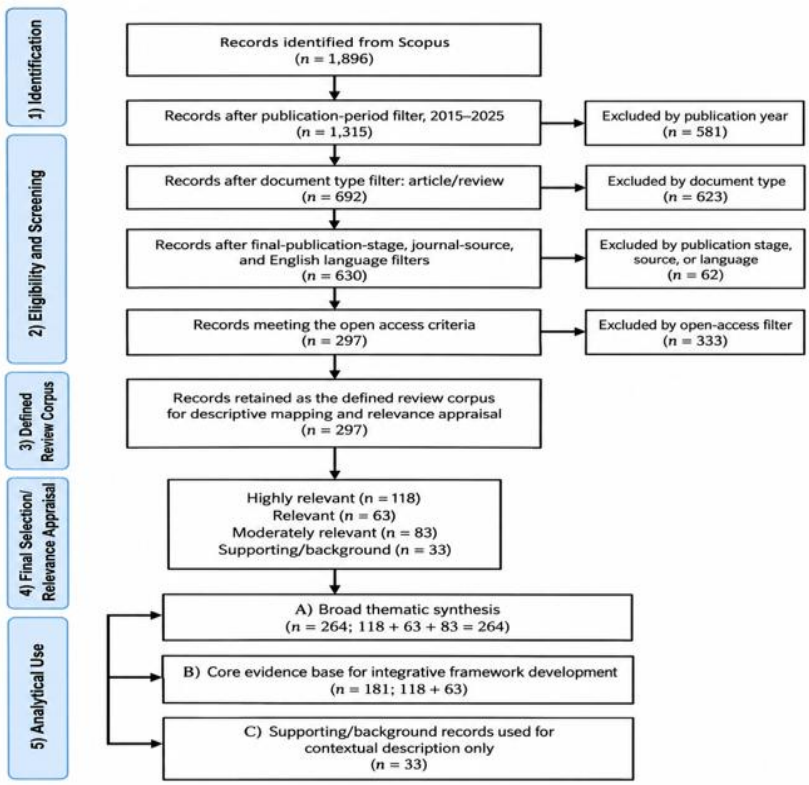


Figure 1. PRISMA-informed corpus construction and analytical classification flow

Note: Figure 1 reports a PRISMA 2020-informed account of corpus identification and database filtering, followed by post-retrieval relevance appraisal and analytical classification. The open-access restriction was applied as an accessibility criterion during corpus construction and not as an indicator of study quality. The 297-record corpus was used for descriptive mapping; 264 records contributed to the broad thematic synthesis, and the 181 highly relevant and relevant records formed the core evidence base for development of the integrative conceptual framework.

3.4 Screening process and PRISMA logic

The identification and corpus-construction process followed a PRISMA 2020-informed reporting logic (Figure 1).

Database filters were applied sequentially and are reported separately from subsequent conceptual relevance assessment. Restricting the publication period to 2015–2025 reduced the dataset from 1,896 to 1,315 records, excluding 581 records. Limiting the corpus to journal articles and review articles reduced the dataset to 692 records, excluding a further 623 records. Filters for final publication stage, journal source, and English language reduced the dataset to 630 records, excluding 62 additional records. Finally, the open-access filter applied during corpus construction retained 297 records and excluded 333 records. These 297 records constituted the defined review corpus for descriptive mapping and subsequent appraisal.

Open-access status is reported as a corpus-construction criterion rather than a quality criterion. As explained in Section 3.3, the restriction facilitated full-text consultation where metadata and abstracts were insufficient for relevance assessment and coding, but it may introduce selection bias by underrepresenting subscription-based publications. The review does not claim that the 297 records represent the complete universe of digital-government scholarship.

Following corpus construction, the 297 records were assessed using titles, abstracts, keywords, metadata, and, where necessary, full texts to determine their degree of conceptual relevance. This stage did not constitute an additional database retrieval step or an additional substantive-exclusion stage. Rather, all 297 records remained within the defined review corpus and were analytically classified through the relevance appraisal described in Section 3.5. On the basis of that appraisal, 118 records were classified as highly relevant, 63 as relevant, 83 as moderately relevant, and 33 as supporting/background. The 264 highly relevant, relevant, and moderately relevant records contributed to the broad thematic synthesis, whereas the 33 supporting/background records were retained primarily for contextual and descriptive mapping. The 181 highly relevant and relevant records formed the core evidence base used to develop the integrative conceptual framework, whereas the 83 moderately relevant records informed the broader synthesis without being treated as core framework evidence. The relevance categories therefore represented analytical weighting within the corpus rather than eligibility decisions or a second stage of study exclusion.

Thus, Figure 1 distinguishes three analytically different stages: (1) identification and database filtering, (2) construction of the 297-record review corpus, and (3) post-retrieval relevance appraisal and analytical classification. No additional records were removed from the defined corpus during Stage 3; instead, records were assigned different analytical roles according to their relevance scores. Supplementary Material (Appendix B) reports the detailed corpus-construction and relevance-classification flow.

3.5 Quality appraisal and relevance assessment

The appraisal combined conceptual relevance and methodological transparency and was used to differentiate the analytical contribution of records to the review rather than as a formal risk-of-bias assessment. Each record was assessed using five criteria: relevance to digital government, relevance to sustainable development, clarity of conceptual contribution, methodological transparency, and relevance to the focal constructs of citizen readiness, governance dynamics, public value co-creation, and sustainable public value outcomes (Table 3).

Each criterion was scored from 0 to 3, yielding a total possible score of 0–15 for each record. Total scores were classified using pre-specified thresholds: 12–15 = Highly Relevant, 9–11 = Relevant, 6–8 = Moderately Relevant, and 0–5 = Supporting/Background. These thresholds were applied consistently across the 297-record corpus, and the article-level scores are reported in Supplementary Material (Appendix D).

Across the review process, one primary reviewer conducted the screening, relevance appraisal, data extraction, and coding. Independent duplicate screening, appraisal, extraction, or coding was not undertaken. To strengthen procedural consistency, the co-authors reviewed the appraisal and coding rules and the resulting synthesis, while ambiguous cases were discussed among the authors before final classification. The appraisal was also supported by the predefined scoring rubric, repeated examination of ambiguous records, and an article-level audit trail. No formal inter-rater or inter-coder reliability coefficient was calculated; accordingly, the resulting relevance bands are treated as a structured analytical classification rather than as a statistically validated measure of reviewer agreement.

Table 3. Relevance and methodological-transparency appraisal rubric

Criterion	Score 0	Score 1	Score 2	Score 3
Relevance to digital government	Not related to digital government	Indirectly related	Moderately related	Directly focused on digital government, e-government, digital governance, smart governance, or digital public services
Relevance to sustainable development	No sustainability relevance	Sustainability only mentioned briefly	Sustainability discussed as a secondary issue	Sustainability central to the study
Conceptual contribution	No conceptual contribution	Mostly descriptive	Provides analytical insight	Provides strong conceptual or theory-building contribution
Methodological transparency	Method unclear or weak	Limited methodological explanation	Clear method with adequate detail	Strong, transparent, and replicable methodology
Relevance to focal constructs	No substantive link to citizen readiness, governance dynamics, public value co-creation, or sustainable public value outcomes	Linked to one focal construct	Linked to two focal constructs	Integrates three or more focal constructs

Note: Each record was assessed using five criteria scored from 0 to 3, yielding a maximum total score of 15. Pre-specified thresholds classified records as highly relevant (12–15), relevant (9–11), moderately relevant (6–8), or supporting/background (0–5). The rubric was used to assess analytical relevance and methodological transparency rather than as a formal risk-of-bias instrument. Article-level scores and classifications are reported in Supplementary Material (Appendix D) to provide an auditable link between the appraisal procedure and the analytical use of the reviewed records.

Application of the scoring criteria resulted in 118 highly relevant records, 63 relevant records, 83 moderately relevant records, and 33 supporting/background records. Thus, 264 records were used for broad thematic synthesis, while 181 highly relevant and relevant records formed the core evidence base for integrative conceptual framework development. The 83 moderately relevant records contributed to the broader thematic synthesis but were not treated as core framework evidence, whereas the 33 supporting/background records were used primarily for contextual and descriptive mapping. These relevance bands therefore indicate analytical weighting within the review rather than methodological validity or study exclusion.

3.6 Data extraction and coding

Data extraction was conducted through a structured matrix covering author, year, title, journal, country or context cue, method, theoretical lens, digital government focus, citizen-related construct, governance construct, co-creation or participation construct, sustainability outcome, key findings, and research gap. The structured extraction matrix was applied consistently across the review corpus to create an article-level audit trail linking bibliographic information, substantive content, and subsequent thematic classification. The complete extraction structure and article-level evidence are reported in the Supplementary Material.

Coding combined deductive and inductive procedures. Deductive codes were derived from the review questions and conceptual background, including digital government, citizen readiness, governance dynamics, public value co-creation, and sustainable public value outcomes. These deductive categories provided the initial coding structure but were not treated as mutually exclusive eligibility criteria. Rather, they were used to identify the extent to which individual studies contributed evidence to one or more focal dimensions of the review.

Inductive codes were added when recurring concepts emerged from the corpus, such as trust readiness, feedback synthesis, symbolic participation, platform governance, public value co-destruction, and equity-sensitive evaluation. Emergent codes were retained when they represented recurring conceptual patterns that were not adequately captured by the initial deductive categories. Where an article contained conceptually ambiguous or overlapping material, coding decisions were reviewed against the operational definitions in the codebook and the article-level extraction record before final classification.

Consistent with the appraisal procedure described in Section 3.5, data extraction and initial coding were undertaken by the primary reviewer using the predefined extraction matrix and coding framework. The co-authors reviewed the coding logic and synthesis, and ambiguous classifications were discussed before the final thematic categories were established. No formal inter-coder reliability coefficient was calculated; therefore, the coding results are interpreted as a structured and auditable thematic synthesis rather than as a statistically validated measure of coder agreement.

Because thematic coding was non-mutually exclusive, a single record could contribute to more than one thematic cluster. Consequently, thematic frequencies should not be summed to represent the number of unique studies in the corpus. Instead, the counts indicate the number of records contributing evidence to each thematic domain. This coding rule underlies the reported thematic frequencies for citizen readiness, governance dynamics, public value co-creation, and sustainable public value outcomes and allows the thematic counts to be traced to the article-level coding matrix.

3.7 Data analysis and thematic synthesis

Data analysis proceeded in four stages. First, descriptive mapping summarized publication trends, document types, source distribution, and relevance bands. Second, conceptual mapping examined how the literature defined and operationalized digital government, sustainability, citizen readiness, governance dynamics, and co-creation. Third, thematic synthesis identified recurring patterns and conceptual tensions across the corpus. Fourth, integrative framework development synthesized recurring evidence patterns, conceptual gaps, and theoretically plausible relationships among the focal constructs within the proposed DR–GD–PVCC–SPV framework. Because the review did not empirically test causal, mediating, or moderating relationships, the relationships incorporated into the framework are treated as theory-building propositions for subsequent empirical examination rather than as empirically established mechanisms.

Analytical transparency was supported through the exact retrieval query, explicit eligibility criteria, a predefined relevance-scoring rubric, structured article-level extraction, a documented coding framework, and supplementary audit materials. The main limitation is that the corpus is limited to Scopus-indexed, English-language, open-access journal articles and review articles meeting the Scopus access filter applied during corpus construction. The open-access restriction facilitated full-text consultation where required for appraisal and coding but may underrepresent subscription-based literature and influence the distribution of journals represented in the corpus. Therefore, the findings should be interpreted as a synthesis of this defined corpus rather than the entire universe of digital government scholarship.

The exact two-block Scopus retrieval query is reported in Section 3.2 and Supplementary Material (Appendix A2). Broader concepts such as citizen readiness, trust, governance capacity, accountability, equity, resilience, and related constructs that did not appear in the final Boolean retrieval query were used only during post-retrieval relevance appraisal, data extraction, and deductive–inductive thematic coding. This distinction separates database retrieval terms from the analytical vocabulary used to interpret the corpus.

Descriptive and bibliometric mapping were used to characterize publication patterns, source distributions, conceptual structures, and keyword relationships, whereas thematic synthesis provided the principal evidence base for framework development. Bibliometric visualizations were therefore treated as descriptive and structural evidence rather than as evidence of causal relationships. The software, data fields, term-cleaning procedures, and figure-specific analytical settings used for the bibliometric outputs are reported in Section 3.8. Because the visualizations were generated through different analytical procedures, methodological parameters are reported only where applicable rather than assumed to be identical across all figures. Supplementary descriptive and bibliometric outputs are reported in Supplementary Material (Figures I1–I8).

The analytical audit trail is documented across the review protocol, eligibility criteria, PRISMA-informed corpus-construction flow, relevance rubric, article-level appraisal

scores, codebook, and extraction matrix. These materials allow the progression from corpus construction to coding, thematic synthesis, and framework development to be traced through an article-level evidence trail. Analytical weighting followed the relevance classification described in Section 3.5. The 264 highly relevant, relevant, and moderately relevant records contributed to the broad thematic synthesis, whereas the 181 highly relevant and relevant records constituted the core evidence base for integrative framework development. The 33 supporting/background records were retained primarily for contextual and descriptive mapping.

Analysis operated at two complementary levels. At the metadata level, titles, abstracts, keywords, document types, years, journals, and context cues were used for descriptive mapping and preliminary classification. At the conceptual level, abstracts and full texts were examined to identify how each article contributed to the focal constructs. As described in Section 3.6, the predefined deductive categories were supplemented by recurring inductive concepts, including trust readiness, feedback synthesis, tokenistic participation, platform governance, public value co-destruction, and equity-sensitive evaluation.

Tables, figures, and supplementary materials were used as complementary reporting and audit devices rather than as independent sources of methodological triangulation. The main interpretive claims were derived from the article-level thematic synthesis, while the supplementary materials preserve the information required to inspect corpus composition, appraisal decisions, coding categories, and evidence extraction.

Thematic synthesis followed an evidence-to-concept logic. Each thematic claim was supported by recurring patterns in the corpus rather than by isolated examples. Citizen readiness was coded when records addressed access, literacy, skills, trust, motivation, empowerment, or participatory capacity. Governance dynamics was coded when records addressed coordination, leadership, data governance, platform governance, stakeholder mobilization, or feedback use. Public value co-creation was coded when records addressed co-production, co-creation, participation, digital commons, complaint systems, or user-centered service improvement. Sustainable public value was coded when records addressed inclusion, accountability, equity, trust, resilience, legitimacy, SDGs, or service continuity. Because coding was non-mutually exclusive, these thematic frequencies represent records contributing evidence to each domain and should not be summed as unique studies.

The synthesis was designed to identify both conceptual contributions and persistent absences. A record could contribute strongly to digital inclusion while remaining weak on governance mechanisms, or it could discuss sustainability without explaining co-creation. These asymmetries were treated as evidence of conceptual fragmentation rather than as coding errors. Accordingly, the proposed integrative framework was developed from recurring patterns of conceptual convergence as well as systematically identified disconnections among citizen readiness, governance dynamics, co-creation, and sustainable public value.

Throughout the analysis, descriptive frequency was distinguished from theoretical contribution. High thematic frequency was not interpreted as evidence of a causal relationship or conceptual integration; framework development instead relied on the substantive patterns, gaps, and connections identified across the core evidence base.

3.8 Bibliometric mapping procedures

Bibliometric and descriptive analyses were employed as complementary mapping procedures to characterize the development, intellectual structure, conceptual organization, and collaboration patterns of the reviewed literature. These analyses were conducted separately from the thematic synthesis described in Section 3.7. Whereas article-level thematic coding provided the primary evidence for conceptual interpretation and framework development, bibliometric mapping was used to describe publication patterns, source distributions, international collaboration, keyword relationships, temporal evolution, and thematic positioning within the defined review corpus.

The bibliometric analyses were conducted using VOSviewer version 1.6.20 and Biblioshiny version 5.0. Biblioshiny version 5.0 was used for the author-keyword co-occurrence network, descriptive bibliometric analysis, and the thematic map. VOSviewer version 1.6.20 was used for the temporal-overlay visualization, the author-keyword density visualization reported in Supplementary Material (Figure I8), and the country co-authorship network reported in Supplementary Material (Figure I4). Author keywords were used as the source field for keyword-based analyses.

Before network construction, author keywords were cleaned using a thesaurus to reduce fragmentation caused by spelling variants, capitalization differences, abbreviations, singular–plural forms, and semantically equivalent expressions. Equivalent terms were harmonized before analysis so that conceptually identical terms were represented consistently across the network visualizations. The cleaned author-keyword dataset provided the common input for the co-occurrence, temporal-overlay, density, and thematic analyses, while each visualization was generated using the software and figure-specific procedure reported below.

The author-keyword co-occurrence network was generated in Biblioshiny version 5.0 from the cleaned author-keyword data. The visualization was used to examine patterns of keyword association and conceptual clustering within the corpus. Node size reflects the relative frequency or prominence of keywords within the network, links represent co-occurrence relationships, spatial proximity indicates relative conceptual association, and node colors distinguish groups of more closely connected keywords. Because this network was generated in Biblioshiny rather than VOSviewer, VOSviewer-specific normalization and counting parameters are not attributed to this figure.

The density visualization reported in Supplementary Material (Figure I8) was generated separately in VOSviewer from the cleaned author-keyword data and was used to identify areas of relatively greater keyword concentration within the corpus.

Temporal variation was examined using the VOSviewer overlay visualization. For this analysis, author-keyword co-occurrence was analyzed using full counting, association-strength normalization, and a minimum occurrence threshold of three. Average publication year was used as the temporal attribute assigned to each keyword. Accordingly, node coloration represents the average publication year of the documents in which a keyword occurred, allowing relatively earlier and more recent topics to be distinguished.

International collaboration was examined through a country co-authorship network generated in VOSviewer and reported in Supplementary Material (Figure I4). The analysis used full

counting to represent co-authorship relationships among countries represented in the reviewed corpus. Countries were treated as the unit of analysis, and network links represent co-authorship connections between countries. The visualization was used descriptively to identify patterns of international research collaboration and was not incorporated into the empirical support for the theoretical relationships of the DR–GD–PVCC–SPV framework.

The thematic map was generated using Biblioshiny version 5.0 from the cleaned author-keyword dataset. The map positions keyword clusters according to their relative centrality and density. Centrality represents the degree to which a theme is connected to other themes in the conceptual structure of the field, whereas density represents the degree of internal development or cohesion of a theme. Consistent with the centrality–density structure, themes were interpreted across four quadrants: Motor Themes, Niche Themes, Emerging or Declining Themes, and Basic Themes. The thematic map was used descriptively to assess thematic positioning and relative structural development within the corpus rather than as direct empirical evidence for the relationships proposed in the integrative framework.

Annual publication frequencies and other descriptive outputs, including source and country distributions, were calculated directly from the cleaned bibliographic metadata without network normalization. Other descriptive outputs, including source and country distributions, were similarly derived from the cleaned bibliographic dataset. Supplementary Material (Appendix I) provides additional descriptive and bibliometric visualizations of relevance classification, source distribution, geographical distribution, country co-authorship, conceptual structure, and keyword density. Figures I1–I8 in the Supplementary Material are treated as supplementary descriptive or structural outputs and not as independent evidence supporting the proposed framework.

For methodological transparency, the software, source field, term-cleaning procedure, and visualization-specific analytical settings are distinguished according to the visualization to which they apply. The author-keyword co-occurrence network and the thematic map were generated in Biblioshiny version 5.0 using cleaned author-keyword data. The temporal overlay was generated in VOSviewer version 1.6.20 using author keywords, full counting, association-strength normalization, a minimum occurrence threshold of three, thesaurus-based cleaning, and average publication year as the temporal attribute. Figure I4 in the Supplementary Material was generated in VOSviewer using countries as the unit of analysis and full counting; Figure I8 in the Supplementary Material was generated from the cleaned author-keyword data as a supplementary density visualization.

4. FINDINGS/RESULTS

4.1 Descriptive profile of the reviewed literature

The defined review corpus comprised 297 Scopus-indexed records published between 2015 and 2025, including 271 journal articles and 26 review articles. All 297 records were retained for descriptive mapping and relevance appraisal. Based on the pre-specified relevance thresholds described in Section 3.5, 264 records contributed to the broad thematic synthesis, while the 181 highly relevant and relevant records constituted the core evidence base for development of the integrative conceptual framework.

Table 4. Descriptive profile of the reviewed literature

Category	Result
Database	Scopus
Export date	April 25, 2026
Defined review corpus	297
Duplicate DOI records	0
Document types	271 journal articles; 26 review articles
Language	English
Publication period	2015–2025
Main disciplinary domains	Public administration; information systems; governance; sustainability; public policy; smart cities
Main analytical focus	Digital government, citizen readiness, governance dynamics, public value co-creation, and sustainable development
Relevance classification	Highly relevant: 118; relevant: 63; moderately relevant: 83; supporting/background: 33
Records retained for descriptive mapping and relevance appraisal	297
Records used for broad thematic synthesis	264
Records used as core evidence for integrative conceptual framework development	181

Note: The table summarizes the composition, relevance classification, and analytical use of the defined 297-record review corpus. The database-filtering sequence leading from the initial retrieval to the defined corpus is reported in Figure 1 and Section 3.4 rather than repeated here.

Table 4 summarizes the principal characteristics and analytical use of the corpus; Supplementary Material (Appendix C) provides the complete article-level bibliographic record and Supplementary Material (Appendix D) reports the corresponding relevance scores and classifications.

The relevance appraisal differentiated the analytical contribution of records within the corpus. As reported in Table 4, of the 297 records, 118 were classified as highly relevant, 63 as relevant, 83 as moderately relevant, and 33 as supporting/background records. Accordingly, 264 records were used for broad thematic synthesis, while 181 highly relevant and relevant records formed the core evidence base for integrative conceptual framework development. The 83 moderately relevant records contributed to the broader thematic synthesis, whereas the 33 supporting/background records were retained primarily for contextual and descriptive purposes. These categories represent analytical relevance rather than methodological quality or eligibility status.

Figure 2 shows a marked increase in the annual number of

publications represented in the defined corpus, particularly in 2024 and 2025, with 52 and 118 records, respectively. Within the boundaries of the reviewed corpus, this pattern indicates a substantial acceleration of scholarly attention to the intersection of digital government and sustainable development. This corpus-level trend is consistent with recent scholarship documenting the growing connection between digital government transformation, sustainable governance, and sustainable development agendas [22-24]. The relevance distribution further shows that 181 records were classified as highly relevant or relevant, providing the principal evidence base for the subsequent conceptual synthesis. Figure I1 in the Supplementary Material presents this distribution descriptively rather than as an independent indicator of review quality.

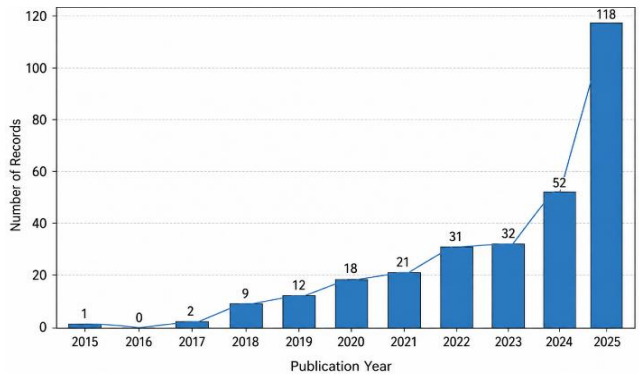


Figure 2. Annual publication trend of reviewed literature

Note: The figure shows the annual distribution of the 297 records included in the defined review corpus from 2015 to 2025. Publication frequencies were calculated directly from the cleaned Scopus bibliographic metadata following the descriptive procedure reported in Section 3.8. The figure is interpreted descriptively and indicates a marked increase in publications represented in the corpus during 2024–2025.

4.2 Evolution of digital government research toward sustainable public value

The reviewed literature reveals a conceptual movement from e-government adoption toward sustainable public value. Earlier studies primarily focused on e-government maturity, service use, technology acceptance, satisfaction, continuance intention, usability, and service quality. Evidence from adoption-oriented studies shows that perceived usefulness, trust, satisfaction, and service quality affect citizens' willingness to use digital government services [25-28]. However, this stream tends to position citizens mainly as users or adopters rather than as agents who can shape public value.

A second stage moves from adoption toward digital transformation. Here, digital government is understood not simply as online service delivery, but as the transformation of institutions, data systems, organizational routines, platforms, and governance arrangements [1, 2]. Studies on smart governance, local digital governance, and government digital capacity show that transformation depends on institutional coordination, leadership, data governance, interoperability, and regulatory alignment [29-31]. A third stage emphasizes citizen-centric digital governance, linking digital government to inclusion, accessibility, trust, cybersecurity, privacy, feedback, and e-participation [32-35]. The fourth stage connects digital government to sustainable public value through outcomes such as inclusion, accountability, transparency, resilience, and legitimacy [22, 36, 37]. Figure 3 summarizes this shift.

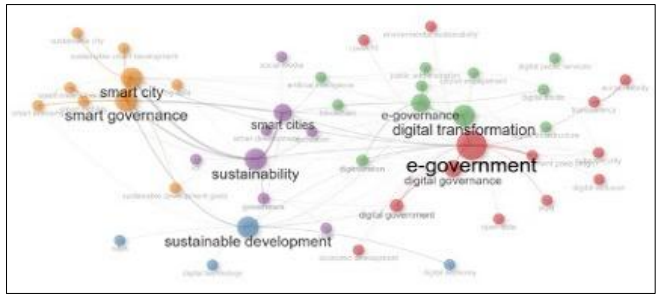


Figure 3. Author-keyword co-occurrence network in digital government and sustainable development research

Note: The author-keyword co-occurrence network was generated using Biblioshiny version 5.0 from the cleaned author-keyword data of the defined 297-record review corpus. Node size reflects the relative frequency or prominence of keywords within the network, while links represent co-occurrence relationships among keywords. Spatial proximity indicates relative conceptual association, and node colors distinguish clusters of keywords that are more closely connected within the network structure. The visualization shows prominent conceptual groupings centered on e-government, digital transformation, digital governance, sustainability, sustainable development, smart governance, smart city, and smart cities. The network is interpreted descriptively as representing patterns of conceptual association and thematic proximity within the corpus; cluster membership, node size, link structure, and spatial proximity should not be interpreted as evidence of causal, mediating, moderating, or sequential relationships among the themes.

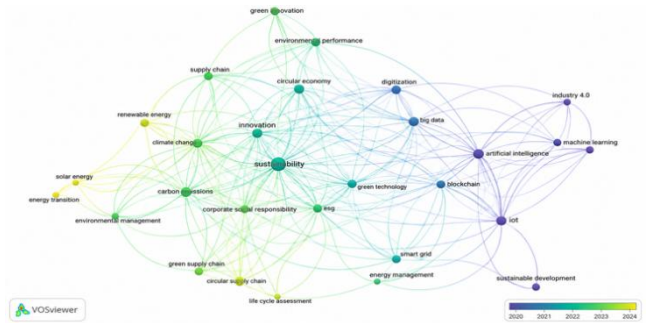


Figure 4. Temporal overlay visualization of author-keyword co-occurrence by average publication year

Note: The temporal overlay visualization was generated in VOSviewer 1.6.20 from the same cleaned author-keyword co-occurrence network used for Figure 3, using full counting, association-strength normalization, and a minimum occurrence threshold of three. Node size represents keyword occurrence frequency, links represent co-occurrence relationships, and node color represents the average publication year of the documents in which each keyword occurred, as indicated by the temporal color scale. Keywords toward the earlier end of the scale have relatively earlier average publication years, whereas keywords toward the later end have relatively more recent average publication years. The visualization is used solely to describe temporal variation in the author-keyword structure of the defined review corpus. It does not demonstrate the emergence, growth, decline, sequential development, or causal relationship of research themes.

Taken together, the two visualizations reveal complementary aspects of the corpus. Figure 3 identifies the conceptual proximity and co-occurrence structure of frequently used author keywords, whereas Figure 4 provides a complementary temporal overlay of the same keyword network based on average publication year. The maps therefore provide descriptive bibliometric context for the thematic findings that follow; neither visualization is interpreted as evidence of causal, mediating, moderating, or sequential relationships among the focal constructs.

4.3 Citizen readiness as a foundational theme

Using the non-mutually exclusive coding procedure

described in Section 3.6, 139 records contributed evidence to at least one citizen-readiness dimension. This figure represents a thematic coding frequency rather than 139 mutually exclusive studies. The coded dimensions included digital access, literacy, skills, trust, privacy, cybersecurity, motivation, accessibility, empowerment, digital divide, and e-participation. Across this cluster, the literature consistently indicates that meaningful engagement with digital government involves more than formal access to online services. Digital access is necessary, but it does not guarantee meaningful use unless citizens also have skills, confidence, trust, and institutional support [9].

The synthesis identifies five dimensions of readiness. Access readiness refers to connectivity, affordability, device availability, and accessible service channels. Skill readiness refers to digital literacy, procedural knowledge, and the ability to navigate public service platforms. Trust readiness concerns confidence in government, data protection, privacy, cybersecurity, and system reliability. Motivational readiness refers to perceived usefulness, willingness, and confidence in using digital services. Participatory readiness refers to citizens' ability to articulate needs, provide feedback, evaluate services, and influence improvement. Taken together, these dimensions are synthesized in this review as a multidimensional form of citizen capacity that extends beyond technology adoption toward the potential for citizen agency in digital public services. Studies on digital literacy and accessibility show that readiness differs across social groups and is shaped by educational, socio-economic, and institutional conditions [34]. Studies on marginalized communities show that digital adoption may remain exclusionary when services are not designed around vulnerable groups [32]. A recurrent gap is that citizen-readiness studies explain access, use, trust, and adoption more frequently than they specify how citizen capacity is translated into institutional influence or service improvement.

Table 5 summarizes the four non-mutually exclusive thematic evidence clusters. The distribution shows substantially greater representation of sustainability-related outcomes (260 records) than explicit public value co-creation (70 records), while citizen readiness (139 records) and governance dynamics (140 records) occupy an intermediate position. These differences indicate uneven thematic attention within the corpus; they motivate the integrative synthesis but do not, by themselves, demonstrate causal relationships among the four constructs.

Table 5. Non-mutually exclusive thematic evidence clusters in digital government for sustainable development research

Thematic Cluster	Records Identified (Overlapping)	Core Concepts	Main Synthesis Contribution	Associated Sustainable Public Value Dimensions
Citizen readiness	139	Digital access, digital literacy, digital skills, trust, privacy, security, motivation, empowerment	Citizen-level capacities associated with accessing, using, trusting, evaluating, and potentially participating in digital public services	Inclusion, equity, reduced digital exclusion, citizen empowerment
Governance dynamics	140	Institutional coordination, leadership, regulatory alignment, data governance, stakeholder activation, feedback use, institutional learning	Institutional processes through which the literature describes coordination, stakeholder activation, resource mobilization, and the use of citizen feedback	Accountability, responsiveness, resilience, service continuity
Public value co-creation	70	Co-design, co-implementation, co-evaluation, co-production, e-participation, citizen feedback	Forms of citizen involvement through which public services may be shaped, implemented, evaluated, or improved jointly with public actors	Legitimacy, trust, service relevance, democratic responsiveness
Sustainable public value outcomes	260	Inclusion, equity, accountability, efficiency, trust, resilience, legitimacy, well-being	Public-value and sustainability outcomes associated in the literature with digital government initiatives	Sustainable development, SDGs, inclusive governance, institutional resilience

Note: Thematic coding was non-mutually exclusive; therefore, a single record could contribute to multiple clusters and the frequencies should not be summed as unique studies. The counts represent article-level coding frequencies derived from the extraction and coding procedure described in Section 3.6. They indicate the distribution of thematic evidence within the corpus and do not represent effect sizes, causal strength, or statistical relationships among the constructs.

4.4 Governance dynamics as an institutional process theme

Governance dynamics constituted the second major thematic cluster, with 140 records contributing evidence to one or more governance-related dimensions under the non-mutually exclusive coding procedure. These dimensions included institutional coordination, leadership, regulatory alignment, data governance, platform governance, stakeholder activation, feedback use, public sector capacity, and organizational learning. Across this literature, sustained digital transformation is commonly associated with institutional arrangements for coordinating actors, mobilizing resources, aligning policy, governing data, and responding to citizen input [1, 2, 38].

Many studies treat governance capacity as an institutional precondition for digital transformation. Research on smart governance and sustainable cities emphasizes multidimensional governance capacity [29]. The World Bank GovTech framework similarly emphasizes institutional enablers [8]. Studies on local digital governance associate government digital capacity with differences in sustainable development outcomes and service performance [30, 31]. Yet the synthesis reveals a recurrent limitation: governance is often treated as a relatively static institutional capacity rather than as an adaptive process unfolding over time.

For analytical purposes, this review organizes governance dynamics around five recurring processes: activation, framing, mobilization, coordination, and feedback synthesis. Activation involves citizens and stakeholders; framing constructs shared problems and public value goals; mobilization deploys

resources and partnerships; coordination aligns agencies and platforms; and feedback synthesis transforms citizen input into institutional learning and service improvement. This process-oriented interpretation is consistent with adaptive-governance scholarship emphasizing responsiveness and learning under conditions of complexity [17]. Within the integrative synthesis, governance dynamics is therefore proposed as a process lens that may help account for variation in how citizen readiness is institutionally recognized and used. This relationship remains a theory-building interpretation derived from the review and requires subsequent empirical testing.

4.5 Public value co-creation in digital government

Public value co-creation was the least frequently coded of the four thematic clusters, with 70 records contributing evidence to one or more dimensions of co-production, co-creation, e-participation, citizen feedback, digital commons, participatory platforms, public service innovation, or citizen engagement. Relative to the other clusters, this distribution indicates that explicit co-creation is less frequently represented and less consistently theorized within the reviewed corpus.

The evidence shows that public value co-creation is often addressed indirectly. Many studies discuss feedback, complaints, participation, usability, or platform interaction, but fewer examine full-cycle co-creation across co-design, co-implementation, and co-evaluation. Co-design involves citizens in problem identification, needs articulation, priority setting, and service design. Co-implementation involves citizens in using, supporting, disseminating, adapting, and complementing digital services. Co-evaluation involves citizens in assessing quality, reporting problems, monitoring outcomes, and contributing to iterative improvement. This understanding is consistent with public service logic, which argues that public value emerges through interaction rather than unilateral service provision [12, 13].

A recurrent distinction in the synthesis is that digital participation should not automatically be treated as equivalent to public value co-creation. Citizens may submit complaints or provide ratings without meaningful influence over priorities, implementation arrangements, or evaluative criteria. For the purposes of this review, participation is classified as substantive co-creation when citizen input has an identifiable role in shaping how services or public value are defined, implemented, evaluated, or improved. Studies on digital commons and citizen coproduction show that institutional design is associated with whether digital interaction develops into substantive coproduction rather than remaining limited to platform use [39].

The synthesis therefore identifies citizen readiness and governance dynamics as theoretically relevant conditions that may support substantive public value co-creation. However, the review does not empirically establish either construct as a necessary, mediating, or moderating cause of co-creation; these relationships are developed later as propositions for future empirical examination.

4.6 Sustainable public value outcomes

Sustainable public value outcomes constituted the most frequently coded thematic cluster, with 260 records contributing evidence to at least one outcome-related dimension, including sustainability, inclusion, equity, accountability, efficiency, trust, resilience, legitimacy, well-being, service continuity, or SDGs. Because coding was non-mutually exclusive, the figure represents the breadth of sustainability-related coding within the corpus rather than 260 studies devoted exclusively to this theme. The literature associates digital government with service improvement, transparency, environmental governance, smart cities, data-driven decision-making, local development, and institutional performance [21, 22, 36, 37].

However, the synthesis shows that sustainability is often treated as a desired outcome rather than as a process connected explicitly to specific governance mechanisms. Many studies associate digital transformation with sustainability through anticipated or reported improvements in access, efficiency, transparency, or governance quality. Fewer studies specify how sustainable public value outcomes might emerge through interactions among citizen capacities, institutional processes, and substantive co-creation.

Across the four clusters, four recurring disconnections are evident. Citizen-readiness studies frequently emphasize access, literacy, trust, and adoption without fully specifying citizen agency; governance studies emphasize capacity and coordination more often than adaptive feedback processes; participation studies sometimes conflate interaction with substantive influence; and sustainability studies frequently identify desirable outcomes without specifying the process through which public value is formed and sustained. These patterns support the use of public value as an interpretive lens for understanding sustainability [3, 4].

Table 6 consolidates illustrative article-level evidence, the dominant contribution of each thematic cluster, recurrent limitations in the literature, and the interpretive implications developed in this review. The matrix distinguishes evidence identified in the corpus from the integrative relationships proposed by the review, thereby avoiding the treatment of these relationships as empirically established causal mechanisms.

The recurring disconnections across the clusters provide the conceptual basis for integrating citizen readiness, governance dynamics, public value co-creation, and sustainable public value in the proposed DR–GD–PVCC–SPV framework. The framework should therefore be understood as a theory-building synthesis of relationships suggested by the literature rather than as an empirically verified causal sequence.

4.7 Missing links and transition to the integrative framework

Cross-cluster synthesis identified six recurring conceptual gaps in the reviewed literature: adoption bias, weak citizen agency, static governance capacity, a fragmented sustainability link, tokenistic participation, and limited full-cycle co-creation. These gaps were identified from recurring patterns of conceptual emphasis and omission across the thematic evidence rather than from mutually exclusive categories or statistical effect estimates.

Adoption bias remains visible in studies focused on acceptance, satisfaction, continuance intention, usage, or service quality. Citizen agency remains underdeveloped because citizens are frequently framed as users, clients, beneficiaries, or data subjects. Governance is often treated as institutional capacity, regulation, or coordination [29-31], but less often as an adaptive institutional process through which citizen capacities may be activated, coordinated, and incorporated into participation or service improvement [17].

Table 6. Evidence to concept synthesis matrix

Conceptual Dimension	Illustrative Coded Evidence from the Corpus	Dominant Evidence Contribution	Recurrent Limitation	Interpretive Implication for This Review
Citizen readiness	A014 (2018) E-government maturity model for sustainable E-government services from the perspective of developing countries | A046 (2019) Determinants of intention to adopt e-government services in Pakistan: An imperative for sustainable development | A064 (2025) Digital Transformation and Social Inclusion in Public Services: A Qualitative Analysis of E-Government Adoption for Marginalized Communities in Sustainable Governance | A041 (2020) Holistic governance for sustainable public services: Reshaping government–enterprise relationships in China's digital government context | A033 (2025) Understanding Smart Governance of Sustainable Cities: A Review and Multidimensional Framework	Provides evidence on citizen-level conditions associated with access, use, trust, digital capability, inclusion, and participation in digital public services.	Citizens are frequently conceptualized as users, adopters, or beneficiaries, with comparatively less attention to their capacity to influence service design, implementation, evaluation, or improvement.	This review therefore extends citizen readiness beyond adoption by interpreting it as a multidimensional capacity that may enable citizen agency and participation in public value co-creation.
Governance dynamics	A126 (2019) Digital commons and citizen coproduction in smart cities: Assessment of Brazilian municipal e-government platforms | A044 (2023) Does the perception of smart governance enhance commercial investments? Evidence from Beijing, Shanghai, Guangzhou, and Hangzhou | A033 (2025) Understanding Smart Governance of Sustainable Cities: A Review and Multidimensional Framework | A017 (2018) Delivering smart governance in a future city: The case of Glasgow | A072 (2024) Evaluation of Local Government Digital Governance Ability and Sustainable Development: A Case Study of Hunan Province	Provides evidence on institutional coordination, leadership, regulatory alignment, data governance, stakeholder engagement, feedback use, and organizational capacities associated with digital transformation.	Governance is more frequently conceptualized as institutional capacity, structure, or coordination than as an adaptive process involving activation, learning, and feedback use over time.	This review proposes governance dynamics as a meso-level institutional process lens for examining activation, framing, mobilization, coordination, and feedback synthesis. Its proposed relationship with citizen readiness and public value co-creation remains theoretical and requires subsequent empirical examination.
Public value co-creation	A126 (2019) Digital commons and citizen coproduction in smart cities: Assessment of Brazilian municipal e-government platforms | A033 (2025) Understanding Smart Governance of Sustainable Cities: A Review and Multidimensional Framework | A189 (2018) Proposing a value-based digital government model: Toward broadening sustainability and public participation | A017 (2018) Delivering smart governance in a future city: The case of glasgow | A001 (2022) Assessing Citizens' Attitudes and Intentions to Adopt E-Government Services: A Roadmap toward Sustainable Development	Provides evidence on citizen participation, co-production, feedback, participatory platforms, and forms of citizen involvement in shaping, implementing, evaluating, or improving digital public services.	Participation, platform use, feedback, and co-creation are not consistently distinguished, and comparatively few studies examine citizen involvement across co-design, co-implementation, and co-evaluation.	This review analytically distinguishes substantive public value co-creation from limited or tokenistic forms of digital participation and organizes co-creation across co-design, co-implementation, and co-evaluation. These dimensions are used as a theory-building analytical structure rather than as an empirically established linear sequence.
Sustainable public value	A014 (2018) E-government maturity model for sustainable E-government services from the perspective of developing countries | A046 (2019) Determinants of intention to adopt e-government services in Pakistan: An imperative for sustainable development | A139 (2023) Inclusive Economic Growth: Relationship between Energy and Governance Efficiency | A064 (2025) Digital Transformation and Social Inclusion in Public Services: A Qualitative Analysis of E-Government Adoption for Marginalized Communities in Sustainable Governance | A044 (2023) Does the perception of smart governance enhance commercial investments? Evidence from Beijing, Shanghai, Guangzhou, and Hangzhou	Provides evidence on sustainability-related and public-value outcomes associated with digital government, including inclusion, accountability, trust, resilience, legitimacy, efficiency, and service continuity.	Sustainability is frequently presented as an intended or associated outcome of digital transformation, while the institutional and participatory processes through which such outcomes may be formed and sustained remain under-specified.	This review interprets sustainable public value as a multidimensional evaluative outcome domain whose potential relationships with citizen readiness, governance dynamics, and public value co-creation warrant subsequent empirical examination. The proposed relationships are theory-building propositions rather than empirically verified causal effects.

Note: Article IDs correspond to the complete article-level corpus reported in Supplementary Material (Appendix C) and the associated appraisal, extraction, and coding records in the supplementary materials. The examples are illustrative rather than exhaustive. The "Dominant Evidence Contribution" and "Recurrent Limitation" columns summarize recurring patterns identified through the thematic synthesis, whereas the "Interpretive Implication for This Review" column reports the authors' theory-building interpretation of those patterns. Accordingly, the matrix provides an evidence-to-concept audit trail linking recurring evidence patterns to the proposed conceptual synthesis; it should not be interpreted as empirical validation of causal, mediating, moderating, sequential, or configurational relationships among citizen readiness, governance dynamics, public value co-creation, and sustainable public value.

Sustainability is frequently treated as a general outcome of digital transformation, while the processes through which sustainable public value is formed and sustained remain under-specified. Digital participation is often limited to feedback or platform interaction without substantive citizen influence. In addition, comparatively fewer studies examine co-creation across the full cycle of co-design, co-implementation, and co-evaluation.

Taken together, these recurring disconnections provide the conceptual rationale for an integrative framework that brings citizen readiness, governance dynamics, public value co-creation, and sustainable public value into a common analytical structure. The proposed relationships should, however, be interpreted as a theory-building synthesis derived from the reviewed literature rather than as an empirically verified causal, mediating, or moderating mechanism. Table 7 summarizes each recurring gap and the corresponding interpretive response developed in this review.

Table 7. Recurring conceptual gaps in the literature and theory-building response of this review

Recurring Conceptual Gap	How It Appears in the Literature	Analytical Significance	Theory-Building Response of This Review
Adoption bias	Many studies focus on technology acceptance, usage, satisfaction, continuance intention, or service quality.	Adoption and service use alone provide limited evidence about whether digital government is associated with inclusion, accountability, trust, citizen influence, or broader public value.	Broadens the analytical focus from technology adoption toward the formation and evaluation of sustainable public value in digital government.
Weak citizen agency	Citizens are often framed as users, clients, beneficiaries, or data subjects.	Service use does not by itself demonstrate meaningful citizen agency, substantive influence, or public value co-creation.	Interprets citizen readiness as a multidimensional capacity for potential agency and participation beyond service adoption, without assuming that readiness automatically results in citizen influence.
Static governance capacity	Governance is often discussed as institutional capacity, regulation, or coordination.	A static capacity perspective provides limited explanation of how institutions activate stakeholders, coordinate resources, process feedback, and adapt over time.	Proposes governance dynamics as a meso-level institutional process lens for examining activation, framing, mobilization, coordination, and feedback synthesis. Its potential relationship with citizen readiness and public value co-creation remains a theory-building proposition requiring subsequent empirical examination.
Fragmented sustainability link	Sustainability is often treated as a general outcome of digital transformation.	The institutional, participatory, and public-value processes associated with sustainable outcomes remain frequently under-specified in the literature.	Interprets sustainability through a sustainable-public-value lens and proposes that its potential relationships with citizen readiness, governance dynamics, and public value co-creation warrant explicit empirical examination.
Tokenistic participation	Participation is frequently limited to feedback, complaints, or platform interaction.	Digital interaction alone does not indicate whether citizen input meaningfully influences priorities, service design, implementation, evaluation, or improvement.	Analytically distinguishes limited or tokenistic forms of digital participation from substantive public value co-creation according to the degree of citizen influence over public-service processes.
Limited full-cycle co-creation	Many studies emphasize service use or feedback rather than co-design, co-implementation, and co-evaluation.	The limited integration of co-design, co-implementation, and co-evaluation leaves the full-cycle character of citizen involvement insufficiently theorized.	Organizes public value co-creation analytically across co-design, co-implementation, and co-evaluation as distinct but potentially related dimensions for subsequent empirical examination, rather than as an empirically established linear sequence.

Note: The table summarizes recurring conceptual gaps identified through the thematic synthesis and the corresponding theory-building responses developed in this review. The gaps represent recurring conceptual patterns across the reviewed corpus rather than mutually exclusive categories, statistical effect estimates, or evidence of causal relationships. The "Analytical Significance" column explains the conceptual importance of each gap, whereas the "Theory-Building Response of This Review" column reports the authors' integrative interpretation of the recurring evidence patterns. These responses should therefore be understood as theory-building propositions for subsequent empirical examination rather than as empirically verified causal, mediating, moderating, conditioning, sequential, or configurational relationships.

Collectively, the six gaps indicate that the literature contains substantial knowledge on adoption, citizen capabilities, institutional capacity, participation, and sustainability, but these domains remain only partially connected. This fragmentation provides the basis for the DR–GD–PVCC–SPV framework developed in Section 5, which integrates the four focal constructs as a set of theoretically plausible relationships for future empirical testing.

The descriptive and bibliometric results provide contextual evidence about the growth and conceptual structure of the reviewed corpus rather than direct evidence for the relationships proposed in the integrative framework. Figure 2 shows a marked increase in publications represented in the corpus during 2024–2025, while Figures 3 and 4 map keyword co-occurrence and temporal variation, respectively. These patterns indicate increasing scholarly attention and thematic diversification within the defined corpus, but they are not interpreted as evidence that the field has reached a particular level of intellectual consolidation or that its concepts have developed through a causal sequence.

The stronger evidence for conceptual fragmentation emerges from the article-level thematic synthesis rather than from the bibliometric maps alone. Across the four thematic clusters, citizen-readiness studies frequently emphasize access, skills, trust, and capability while giving less attention to how such capacities become institutional influence; governance studies emphasize institutional capacity and coordination more often than adaptive feedback processes; co-creation studies address participation and interaction more frequently than substantive citizen influence; and

sustainability studies identify desirable outcomes more often than the processes through which those outcomes are formed and sustained. Figures 3 and 4 provide complementary bibliometric context for these patterns, but the interpretation of these gaps rests primarily on the coded article-level evidence summarized in Tables 5-7.

The four thematic domains are therefore analytically related but should not be interpreted as an empirically established sequence. Citizen readiness captures citizen-level capacities; governance dynamics captures institutional processes of activation, coordination, and learning; public value co-creation captures forms of citizen involvement in shaping, implementing, and evaluating digital public services; and sustainable public value captures the broader outcome domain. Their recurrent disconnections across the literature provide the conceptual basis for examining how these domains may relate to one another, while leaving the direction, strength, and causal form of those relationships for subsequent empirical testing.

The thematic coding further shows an uneven distribution of attention across these domains. Sustainability-related outcomes were coded in 260 records, whereas explicit public value co-creation appeared in 70 records, with citizen readiness and governance dynamics represented in 139 and 140 records, respectively. Because coding was non-mutually exclusive, these figures indicate relative thematic representation rather than mutually exclusive study categories. The imbalance suggests that sustainability-related claims are substantially more prevalent in the corpus than explicit theorization of full-cycle co-creation and the institutional processes connecting citizen capacity with public-value formation. This combination of expansion and conceptual fragmentation motivates the integrative synthesis developed in the next section without establishing that the proposed relationships have already been empirically demonstrated.

Figure 5 provides a complementary thematic-map perspective by positioning author-keyword clusters according to their relative centrality and density.

The article-level evidence matrix provides a complementary audit trail for the thematic synthesis. It indicates that records frequently address individual or partially combined dimensions of digital government, citizen capacity, governance, participation, and sustainability, whereas explicit integration across all four focal constructs is less common. Importantly, the relevance classifications are used to differentiate analytical contribution rather than methodological quality: highly relevant and relevant records provide the core evidence for integrative framework development, moderately relevant records contribute to the broader thematic synthesis, and supporting/background records are used primarily for contextual interpretation. Accordingly, the 297-record corpus supports descriptive mapping and relevance appraisal, 264 records contribute to the broad thematic synthesis, and 181 highly relevant and relevant records constitute the core evidence base for the theory-building framework.

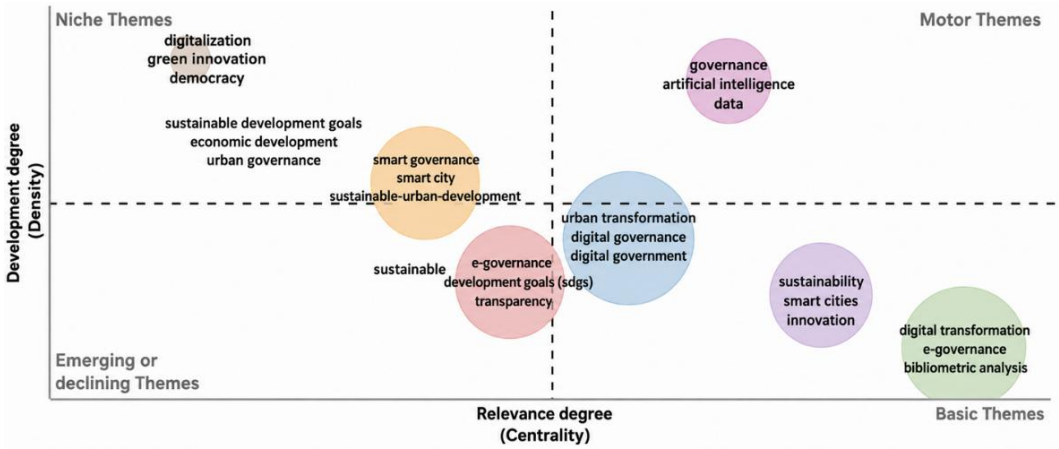


Figure 5. Thematic map of digital government for sustainable development research

Note: The thematic map positions the main themes according to centrality and density. The distribution indicates that digital government, digital governance, sustainability, smart cities, and governance-related themes are well established, while issues related to citizen readiness, public value co-creation, and substantive participation remain less integrated into the core structure of the field. The map is interpreted descriptively to assess thematic positioning and relative structural development within the corpus; it does not constitute direct empirical evidence for the relationships proposed in the integrative framework.

The supplementary bibliometric visualizations in Supplementary Material (Appendix I) provide descriptive context for this pattern by mapping keyword co-occurrence, temporal variation, keyword density, thematic positioning, co-citation, and bibliographic coupling within the defined corpus. Taken together, these analyses indicate a field characterized by multiple interconnected but not fully consolidated conceptual domains. They are interpreted as complementary evidence of the intellectual and conceptual structure of the corpus rather than as independent confirmation of the causal relationships proposed in the DR–GD–PVCC–SPV framework. The article-level thematic synthesis therefore remains the primary basis for the conceptual gaps and theory-building relationships developed in the subsequent framework.

5. INTEGRATIVE FRAMEWORK: THE PROPOSED DR–GD–PVCC–SPV FRAMEWORK OF SUSTAINABLE DIGITAL GOVERNMENT

5.1 Rationale of the integrative framework

Building on the thematic findings, this section develops the proposed DR–GD–PVCC–SPV framework as an integrative, theory-building synthesis of digital readiness of citizens, governance dynamics, public value co-creation, and sustainable public value outcomes (Figure 6). Rather than specifying an empirically established causal sequence, the framework organizes theoretically plausible relationships among these constructs that emerge from recurring patterns and conceptual disconnections across the reviewed literature.

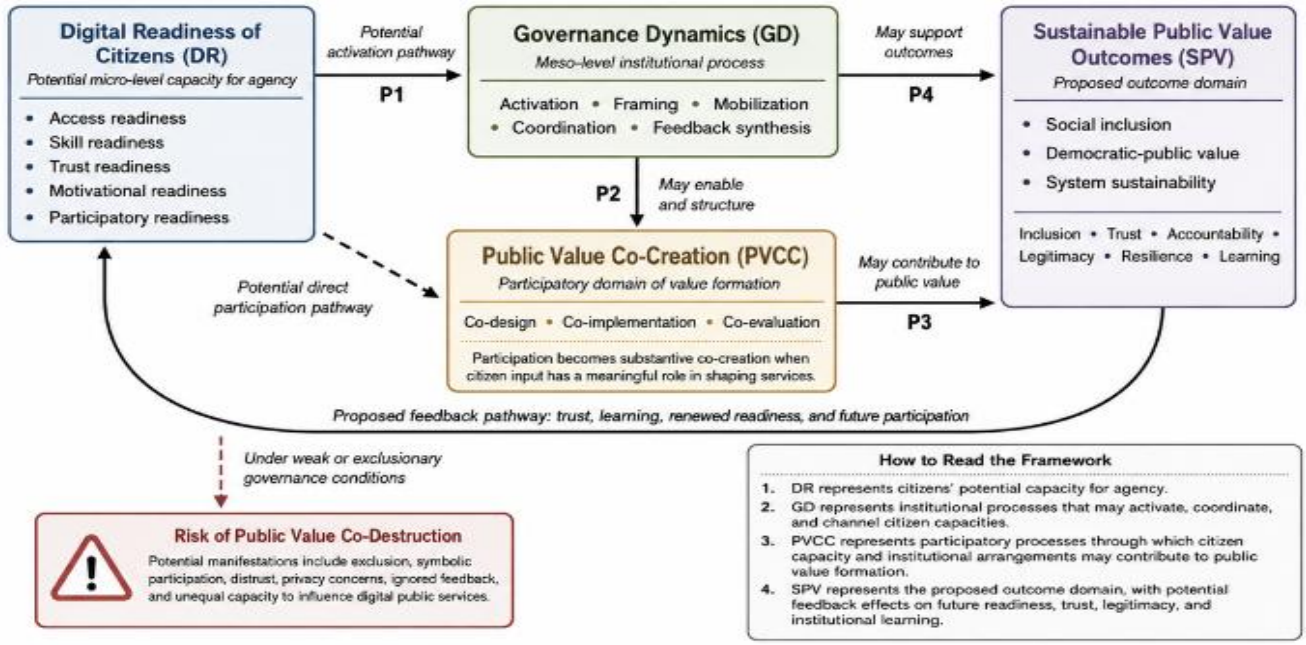


Figure 6. Proposed DR–GD–PVCC–SPV integrative conceptual framework

Note: The figure presents a theory-building conceptual synthesis derived from the thematic findings rather than an empirically tested causal model. Digital readiness of citizens (DR) is positioned as a potential micro-level capacity for agency; governance dynamics (GD) represents meso-level institutional processes; public value co-creation (PVCC) represents the participatory domain of value formation across co-design, co-implementation, and co-evaluation; and sustainable public value (SPV) represents the proposed outcome domain. Arrows indicate theoretically plausible relationships synthesized from the reviewed literature rather than empirically verified causal, mediating, or moderating effects. P1–P4 denote propositions for subsequent empirical examination. The feedback and public value co-destruction pathways are likewise conceptual propositions requiring future empirical testing.

Digital readiness refers specifically to citizens' capacity to access, understand, trust, use, evaluate, and shape digital public services. Within the framework, readiness is therefore conceptualized not merely as a technological or adoption-related condition, but as a multidimensional citizen capacity that may support agency and participation in public value formation.

The framework responds to the central fragmentation identified through the thematic synthesis. The literature has developed substantial knowledge on digital government, inclusion, governance capacity, participation, and sustainability, but these themes are often examined separately. Many studies explain adoption, institutional capacity, or sustainability outcomes without specifying how they are connected.

The DR–GD–PVCC–SPV framework addresses this fragmentation by proposing a set of theoretically plausible relationships among the four domains. Citizen readiness is positioned as a potential micro-level capacity for agency; governance dynamics is proposed as a meso-level institutional process through which citizen capacities may be activated, coordinated, and incorporated into public-service processes; public value co-creation represents the domain in which citizens may participate across co-design, co-implementation, and co-evaluation; and sustainable public value represents the broader outcome domain associated with inclusion, accountability, legitimacy, resilience, and institutional learning. These relationships are derived from the integrative synthesis and should be treated as propositions for subsequent empirical examination rather than as demonstrated mediating, moderating, or causal effects.

5.2 Framework components

The theoretical contribution of the proposed framework lies in three forms of conceptual integration. First, it repositions citizen readiness from a conventional adoption variable into a multidimensional capacity for potential citizen agency. Citizens are not conceptualized merely as users or beneficiaries, but as actors who may contribute to defining, implementing, evaluating, and improving public value. This extends readiness beyond access and technology use to include the capacities required for meaningful engagement with digital public services.

Second, it conceptualizes governance dynamics as a meso-level institutional process that may activate, coordinate, and channel citizen capacities toward participation and public value co-creation. Governance is therefore not treated as a static institutional background, but as a dynamic process of activation, framing, mobilization, coordination, and feedback synthesis. The framework does not assume that governance dynamics empirically mediate or moderate the relationship between readiness and co-creation; rather, it proposes this relationship for subsequent empirical examination. Third, it reframes sustainability not as an automatic consequence of digitalization, but as a sustainable public value outcome domain that may be associated with citizen capacity, adaptive institutional processes, and substantive public value co-creation. This interpretation shifts attention from whether digital technologies are adopted to whether digital government is associated with inclusion, accountability, legitimacy, resilience, learning, and other durable forms of public value.

The first component, digital readiness of citizens (DR), consists of access, skills, trust, motivation, and participatory capacity. The second component, governance dynamics (GD), consists of activation, framing, mobilization, coordination, and feedback synthesis. The third component, public value co-creation (PVCC), consists of co-design, co-implementation, and co-evaluation. These phases are treated as analytically distinct forms of citizen involvement rather than as a

mandatory linear sequence. The fourth component, sustainable public value outcomes (SPV), is interpreted through social inclusion outcomes, democratic-public value outcomes, and system sustainability outcomes. Together, the four components bring insights from digital inclusion, digital government, adaptive governance, public service logic, and public value scholarship into a common theory-building framework [1, 3, 12, 13, 17]. Their proposed relationships are conceptual rather than empirically verified and provide the basis for the propositions developed in the following section.

5.3 Proposed framework relationships

The framework organizes a set of theoretically plausible relationships among citizen readiness, governance dynamics, public value co-creation, and sustainable public value rather than specifying a linear or empirically established causal sequence. Citizen readiness is positioned as a potential micro-level capacity for engagement and agency. However, the thematic synthesis suggests that citizen capacity alone does not necessarily translate into substantive influence over digital public services; institutional processes may shape whether and how such capacity is recognized, coordinated, and incorporated into service processes. Governance dynamics is therefore proposed as a meso-level institutional process involving activation, framing, mobilization, coordination, and feedback synthesis. In the proposed framework, these processes may enable, structure, or constrain the relationship between citizen readiness and substantive participation. This formulation does not assume that governance dynamics statistically mediate or moderate the relationship between readiness and co-creation; rather, mediation, moderation, and alternative configurational relationships remain propositions for subsequent empirical testing.

Public value co-creation is positioned as the participatory domain in which citizen capacities and institutional arrangements may contribute to public value formation. Co-design allows citizens to shape problems, priorities, and service features. Co-implementation involves citizens in use, dissemination, support, and adaptation. Co-evaluation enables citizens to assess performance, provide feedback, and influence iterative improvement. These three dimensions are treated as analytically distinct forms of co-creation rather than as a mandatory sequential pathway. For the purposes of this review, digital participation is treated as substantive public value co-creation when citizen input has an identifiable role in shaping how public services or public value are defined, implemented, evaluated, or improved [11, 14].

Sustainable public value is conceptualized as the proposed outcome domain potentially associated with the interaction of citizen capacities, institutional governance processes, and substantive co-creation. The framework distinguishes three outcome dimensions: social inclusion, democratic-public value, and system sustainability. Social inclusion outcomes include equity, accessibility, empowerment, and reduced exclusion. Democratic-public value outcomes include accountability, transparency, trust, legitimacy, responsiveness, and citizen influence. System sustainability outcomes include resilience, service continuity, adaptive capacity, institutional learning, and long-term improvement.

This outcome structure shifts the evaluative focus beyond platform availability, adoption, or administrative efficiency toward whether digital government is associated with inclusive, legitimate, accountable, responsive, and resilient forms of public value. The proposed pathways shown in Figure 6 should therefore be read as theory-building relationships synthesized from the literature rather than as empirically verified causal, mediating, or moderating effects.

5.4 Proposed propositions

The framework generates four propositions for future empirical research. Proposition 1 (P1) proposes that higher levels of digital readiness reflected in access, skills, trust, motivation, and participatory capacity are more likely to support substantive public value co-creation.

Proposition 2 (P2) proposes that governance dynamics may enable and structure the relationship between citizen readiness and public value co-creation through activation, framing, mobilization, coordination, and feedback synthesis. Whether governance dynamics operates empirically as a mediator, moderator, or alternative configurational condition remains an open question for subsequent testing.

Proposition 3 (P3) proposes that substantive public value co-creation may contribute to sustainable public value by enabling citizen involvement across co-design, co-implementation, and co-evaluation. The proposition does not assume an empirically established mediating effect; rather, it identifies a theoretically plausible pathway for future examination.

Proposition 4 (P4) proposes that sustainable public value outcomes are more likely to be associated with digital government initiatives that combine inclusive citizen readiness, adaptive governance dynamics, and substantive co-creation than with initiatives centered primarily on platform provision or adoption.

Taken together, the propositions frame sustainable digital government as a relational and process-oriented phenomenon while leaving the direction, strength, and causal form of the proposed relationships open to empirical examination.

Figure 6 visualizes these propositions as theory-building relationships rather than empirically verified causal paths. It also introduces a proposed feedback pathway through which sustainable public value outcomes may be associated with future readiness, trust, legitimacy, learning, and participation, as well as a potential co-destruction pathway under weak or exclusionary governance conditions. These recursive relationships remain conceptual propositions requiring empirical investigation.

The framework also provides a diagnostic tool for empirical analysis. Researchers and practitioners may use the framework to examine where disconnections occur, for example, whether citizen capacity is limited, institutional processes fail to incorporate participation, citizen involvement remains tokenistic, or sustainability claims are weakly connected to demonstrable public-value outcomes. This diagnostic use complements, rather than substitutes for, empirical testing of the proposed relationships.

Table 8 summarizes the four theory-building propositions derived from the integrative synthesis. They are not hypotheses estimated from the reviewed corpus, but conceptual relationships that can be examined through quantitative, qualitative, mixed-methods, comparative, longitudinal, or configurational designs.

Table 8. Theory-building propositions derived from the integrative review

Proposition	Theory-Building Proposition	Related Constructs
P1	Higher levels of digital readiness, reflected in access, skills, trust, motivation, and participatory capacity, are proposed to be associated with a greater likelihood of substantive public value co-creation. This proposition treats digital readiness as a potential capacity for participation rather than as a sufficient or deterministic cause of co-creation.	Digital readiness of citizens; public value co-creation
P2	Governance dynamics is proposed as a meso-level institutional process that may shape the relationship between citizen readiness and public value co-creation through activation, framing, mobilization, coordination, and feedback synthesis. Its potential mediating, moderating, conditioning, or configurational role remains an empirical question for subsequent research.	Governance dynamics; digital readiness of citizens; public value co-creation
P3	Substantive public value co-creation is proposed as a participatory domain through which citizen involvement in co-design, co-implementation, and co-evaluation may be associated with sustainable public value outcomes. The proposition does not assume a mediating effect; whether public value co-creation functions as a mediator, pathway, or other relational process requires subsequent empirical examination.	Public value co-creation; sustainable public value outcomes
P4	Sustainable public value outcomes are proposed to be more strongly associated with digital government initiatives that combine inclusive citizen readiness, adaptive governance dynamics, and substantive public value co-creation than with initiatives centered primarily on platform provision or service adoption. This relationship is proposed for future empirical testing rather than treated as an established comparative effect.	Digital readiness; governance dynamics; public value co-creation; sustainable public value

Note: P1–P4 summarize theory-building propositions derived from the integrative synthesis of the reviewed literature. They represent theoretically plausible relationships among the focal constructs and should not be interpreted as empirically established causal, mediating, moderating, conditioning, or configurational effects. The propositions are intended to guide subsequent empirical examination using quantitative, qualitative, mixed-methods, comparative, longitudinal, process-tracing, or configurational designs.

6. DISCUSSION

6.1 Beyond adoption: Repositioning digital government as public value formation

This integrative systematic review advances a public value-centered interpretation of sustainable digital government by showing that the literature increasingly extends beyond questions of technology adoption and administrative efficiency toward issues of citizen capacity, institutional responsiveness, participation, and sustainable public value. Rather than indicating a complete replacement of adoption-oriented research, the synthesis suggests a broadening of the field's analytical agenda.

This broadening has an important theoretical implication: digitalization should not be treated as equivalent to public value creation. Digital platforms, online services, and data infrastructures may improve access, efficiency, or administrative capacity, but their presence alone does not demonstrate inclusion, accountability, trust, legitimacy, resilience, or meaningful citizen influence. From a public value perspective, these outcomes require separate analytical attention because the value of digital government depends not only on technological performance but also on how public institutions respond to citizen needs, distribute benefits and burdens, and sustain legitimate and inclusive public-service relationships [3, 4].

Adoption-oriented research therefore remains foundational but analytically incomplete for evaluating sustainable digital government. Studies of e-government adoption, continuance intention, satisfaction, trust, and service use provide important explanations of why citizens adopt or continue using digital public services [25-28]. However, adoption or continued use should not be treated as a proxy for public value. Citizens may use services because they are convenient or mandatory, while exclusion, low trust, weak accountability, or symbolic participation remain unresolved [8].

The contribution of this review is therefore to distinguish between digital service uptake and public value formation. The former concerns whether citizens access and use digital services; the latter concerns whether digital government is associated with inclusive access, meaningful agency, institutional responsiveness, accountability, legitimacy, and durable service improvement. This distinction reframes adoption as one component of sustainable digital government rather than its final evaluative criterion.

Within this interpretation, citizen readiness, governance dynamics, and public value co-creation are not presented as empirically verified sequential causes of sustainable public value. Instead, the synthesis identifies them as conceptually related domains that warrant joint examination. Citizen readiness directs attention to citizens' capacities for access, trust, use, and participation; governance dynamics highlights institutional processes of coordination, activation, and feedback; and public value co-creation focuses on the extent to which citizens can meaningfully contribute to service design, implementation, and evaluation. Their integration in the proposed framework therefore represents a theory-building response to the fragmentation identified in the literature rather than a causal pathway demonstrated by the review.

6.2 Citizen readiness as a capacity for agency

The review extends digital inclusion and digital divide scholarship by conceptualizing citizen readiness as a multidimensional capacity for potential agency rather than merely as access or adoption capacity. Existing studies show that digital inequality increasingly concerns material access, skills, usage patterns, and outcomes rather than connectivity alone [9]. Building on this literature, the review identifies access, skills, trust, motivation, and participatory capacity as analytically relevant dimensions of readiness for engagement with digital public services. The theoretical implication is that readiness should be distinguished from agency itself: citizens may possess digital capabilities without necessarily acquiring meaningful influence over institutional decisions.

This reframing matters because digital government can reproduce exclusion even when services are formally available online. Studies of marginalized groups, digital accessibility, literacy, the digital divide, and e-participation indicate that

formal service availability may coexist with unequal capacity to access, understand, trust, and influence digital services [33-35, 40, 41].

Citizen readiness should therefore not be reduced to the ability to log into a platform or complete a transaction. It is more appropriately understood as a potential capacity to understand, evaluate, question, and participate in digital public-service processes. Whether that capacity becomes substantive influence depends on institutional and participatory conditions that must be examined empirically.

6.3 Governance dynamics as a proposed meso-level process lens

A second interpretive contribution of the review is to position governance dynamics as a meso-level process lens between citizen-level capacities and institutional arrangements. Much literature recognizes the importance of institutional capacity, coordination, leadership, regulation, and data governance [29-31]. However, a predominantly capacity-oriented perspective provides only a partial account of how institutions respond to citizen input over time. Whereas governance capacity emphasizes resources, structures, and institutional capabilities, governance dynamics directs attention to processes through which actors may be activated, problems framed, resources mobilized, activities coordinated, and feedback incorporated.

Governance dynamics is distinct from, but related to, governance capacity and adaptive governance. It consists of activation, framing, mobilization, coordination, and feedback synthesis. Within this process lens, feedback synthesis is particularly important because it draws attention to whether citizen experiences and participatory inputs are merely collected or are subsequently interpreted and incorporated into institutional learning. Complaints, ratings, consultations, and other digital inputs may remain informational signals without substantive consequences; where institutions systematically interpret and respond to such inputs, they may contribute to service redesign, accountability, and adaptive learning.

This interpretation is consistent with adaptive governance scholarship, which emphasizes learning and responsiveness under conditions of complexity [17], while extending the discussion toward the institutional treatment of digitally mediated citizen input. The review does not establish governance dynamics as a verified mediating mechanism; rather, it proposes the construct as a process lens whose mediating, moderating, or configurational role remains to be empirically tested.

6.4 From participation to public value co-creation

The review clarifies a conceptual distinction often blurred in digital governance research: digital participation is not the same as public value co-creation. Citizens may submit feedback, use complaint systems, join consultations, or interact with platforms without having substantive influence over priorities, design, implementation, or evaluation. Such interaction may improve communication, but it does not necessarily constitute co-creation.

For the purposes of this review, public value co-creation is distinguished from participation by the substantive role of citizen input in shaping how services or public value are defined, implemented, evaluated, or improved. This interpretation is consistent with public service logic, which views value as emerging through interaction among service actors rather than being produced unilaterally by government [12, 13]. At the same time, digital co-creation scholarship shows that technology-enabled participation does not necessarily result in substantive citizen influence, because digital interactions may remain limited to feedback, platform use, or symbolic participation when institutional arrangements do not enable meaningful involvement [11, 14]. The distinction is therefore not between participation and non-participation, but between interaction that primarily generates citizen input and participation that gives citizens a meaningful role in public-value formation.

Taken together, these distinctions support a more conditional interpretation of sustainable digital government. Citizen readiness represents potential capacity rather than realized influence; governance dynamics represents an institutional process lens rather than a verified causal mechanism; and co-creation requires more than the existence of digital interaction. This interpretation also tempers technologically deterministic accounts of digital transformation by recognizing the possibility of unequal voice, symbolic participation, exclusion, privacy concerns, and public value co-destruction. Such outcomes are treated here as potential risks associated with particular institutional and participatory conditions rather than as inevitable consequences of weak governance.

These insights also reposition sustainability within digital government research. Rather than treating sustainability as an external policy label or an assumed consequence of digital transformation, the review conceptualizes sustainable public value as a multidimensional evaluative domain encompassing inclusion, democratic-public value, and system sustainability. This perspective directs attention to who benefits from digital transformation, whose participation carries influence, how institutions respond to citizen input, and whether public services remain accountable, legitimate, adaptive, and resilient over time.

A corresponding implication is the need to examine public value co-destruction alongside public value creation. Digital systems may be associated with exclusion of vulnerable users, unequal voice, privacy or surveillance concerns, and feedback processes that collect citizen input without increasing citizen influence. The co-destruction pathway in the proposed framework therefore identifies a research agenda rather than an empirically established effect: future studies should examine the institutional, technological, and participatory conditions under which digital government contributes to, fails to create, or potentially erodes public value.

Accordingly, the review redirects analytical attention from digitalization as an end in itself toward the conditions, processes, and consequences associated with sustainable public value formation.

The broader implication is that sustainable digital government should be evaluated not only by the availability, adoption, or maturity of digital services, but also by their association with inclusion, meaningful citizen influence, institutional responsiveness, accountability, legitimacy, learning, and resilience. This evaluative shift does not establish a universal pathway from digitalization to public value; rather, it provides a theoretically grounded agenda for investigating when, how, and under what conditions digital government contributes to sustainable public value.

7. IMPLICATIONS

The review has theoretical, methodological, and practical implications for understanding and evaluating sustainable digital government. Theoretically, the proposed DR-GD-PVCC-SPV framework reframes sustainable digital government as a set of potentially interrelated citizen-, institutional-, participatory-, and public-value dimensions rather than as an automatic consequence of technological modernization. This shifts the analytical focus from technology-centered explanations of digital transformation to a public value-centered perspective that asks whether and under what conditions digital government is associated with socially and institutionally meaningful outcomes. Existing studies have contributed important insights into digital government, adoption, institutional transformation, and public management [1, 2]. However, the synthesis indicates that sustainability should not be inferred from platform availability, service digitization, or user uptake alone. A broader evaluative perspective should complement adoption and performance indicators with public-value dimensions, including inclusion, equity, accountability, trust, responsiveness, legitimacy, and resilience [3, 4].

Methodologically, the framework provides a basis for examining relationships among micro-level citizen readiness, meso-level governance dynamics, participatory processes of public value co-creation, and sustainable public value outcomes without prespecifying a single causal structure. Quantitative studies can test whether governance dynamics functions as a mediator, moderator, or other conditional factor in the relationship between citizen readiness and public value co-creation. They can also examine whether public value co-creation is associated with variation in sustainable public value outcomes.

Qualitative studies can trace how citizen feedback is interpreted, filtered, ignored, or incorporated into or excluded from institutional learning and service redesign. Longitudinal and mixed-methods designs are particularly valuable because they can capture both changes in relevant outcomes and the institutional processes through which digital participation may acquire, lose, or fail to acquire substantive influence over time. This is consistent with adaptive governance scholarship, which emphasizes learning, responsiveness, and institutional adjustment in complex public systems [17].

Practically, the synthesis suggests that governments should approach digital transformation as both a technological and a governance challenge. Public agencies need to pay attention to digital capabilities, accessible and inclusive service design, trust and cybersecurity, meaningful participation channels, and differentiated support for citizens who face digital exclusion [32], marginalized communities [33], accessibility [34], digital literacy [35], digital divide, cybersecurity, and trust.

Beyond providing digital access, public agencies should develop institutional arrangements through which citizen input can be systematically received, interpreted, responded to, and, where appropriate, incorporated into service improvement. Such arrangements may include structured feedback procedures, co-design forums, cross-agency response protocols, iterative service review, equity-sensitive evaluation, and indicators that capture trust, accountability, accessibility, and responsiveness.

Where participation is collected but has little connection to institutional response, digital engagement may remain symbolic, reproduce unequal voice, or contribute to conditions associated with public value co-destruction. The practical challenge is therefore not only to digitize services, but also to create institutional conditions under which citizen capacities and participation can meaningfully inform more inclusive, accountable, responsive, and resilient public services.

For governments pursuing digital transformation under sustainability mandates, an additional implication concerns evaluation. Digital performance indicators should be complemented by public-value indicators. User numbers, transaction speed, and platform availability can be assessed alongside measures of inclusion, trust, responsiveness, accountability, accessibility, citizen influence, resilience, and learning. This broader approach helps distinguish administrative or technological performance from the wider question of whether digital transformation is associated with sustainable public value [10].

8. FUTURE RESEARCH AGENDA

Future research should advance digital government scholarship by testing, refining, and extending the DR-GD-PVCC-SPV framework across diverse institutional, social, and technological contexts. Theoretically, future studies should examine whether governance dynamics functions as a mediator, moderator, or configurational condition in the relationship among citizens' digital readiness, public value co-creation, and sustainable public value outcomes. Such research should test alternative relational structures rather than assume a predetermined causal sequence. In particular, studies could examine whether citizen readiness is directly associated with public value co-creation, whether governance dynamics strengthens or channels this relationship, and whether different combinations of activation, framing, mobilization, coordination, and feedback synthesis are associated with different co-creation and public-value outcomes.

Empirically, future research should compare different levels of government, policy sectors, and territorial contexts. Research in local-government and developing-country settings is particularly valuable because substantial variation may exist in digital access, citizen capabilities, institutional capacity, public trust, and opportunities for meaningful participation. Comparative studies across territorial settings with different levels of digital readiness and institutional capacity, as well as across different public-service sectors, could examine the conditions under which digital government is associated with greater inclusion and citizen influence or, conversely, with persistent exclusion and unequal voice. Such comparative work would also help establish the contextual boundaries of the proposed framework rather than assuming that its relationships operate uniformly across governance systems.

Methodologically, future studies should move beyond cross-sectional adoption models. Longitudinal research can examine whether changes in the depth and form of public value co-creation are followed by changes in trust, legitimacy, accountability, resilience, service continuity, and other sustainable public value outcomes over time. Mixed-methods designs can combine quantitative testing with qualitative process tracing of how citizen feedback is interpreted, filtered, ignored, or incorporated into or excluded from institutional learning and service redesign. Configurational approaches may also be useful for examining whether different

combinations of citizen readiness, governance dynamics, and co-creation are associated with similar public-value outcomes under different institutional conditions. Finally, future research should develop a critical agenda on public value co-destruction, examining the conditions under which digital transformation may be associated with exclusion, surveillance and privacy concerns, unequal participation, symbolic consultation, or institutional non-responsiveness.

Together, these research directions would allow the proposed framework to be empirically tested, challenged, refined, and, where necessary, reconfigured. They would also clarify whether the proposed relationships are linear, mediated, moderated, recursive, configurational, or context dependent, while maintaining attention to unequal and potentially value-destroying forms of digital transformation.

Future reviews may further assess the robustness of the synthesis by applying transparent search, appraisal, extraction, and coding procedures to additional databases, regions, sectors, and time periods. Such replication and extension would help determine whether the relationships proposed in the DR-GD-PVCC-SPV framework remain analytically useful across contexts or require conceptual and contextual refinement.

9. CONCLUSION

This integrative systematic literature review challenges technology-centered assumptions that digitalization, service availability, or adoption alone are sufficient indicators of sustainable digital government. Across the defined corpus of 297 Scopus-indexed articles and reviews, the synthesis indicates that evaluating sustainable digital government requires attention not only to technological and administrative performance but also to citizen capacity, institutional responsiveness, meaningful participation, and sustainable public value.

The proposed DR-GD-PVCC-SPV framework integrates these previously fragmented domains by positioning digital readiness as a potential capacity for citizen agency, governance dynamics as a meso-level institutional process, public value co-creation as a participatory domain spanning co-design, co-implementation, and co-evaluation, and sustainable public value as the broader outcome domain. These relationships constitute theory-building propositions derived from the integrative synthesis rather than empirically verified causal, mediating, or moderating effects.

Future research should therefore test, refine, and where necessary reconfigure the proposed relationships across diverse institutional, territorial, sectoral, and social contexts, including conditions under which digital transformation may contribute to public value co-destruction rather than public value creation.

SUPPLEMENTARY MATERIAL

The supplementary material cited in this article is available in Zenodo at https://doi.org/10.5281/zenodo.22868068.

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