

A User-Centred E-Government Service Design Framework to Enhance Public Trust in Sustainable Policies

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ABSTRACT

The rapid expansion of digital governance has positioned e-government services as a central mechanism for improving public service delivery and advancing sustainable development. Although these services are intended to promote efficiency, transparency, and accountability, their effectiveness is largely determined by the User Experience (UX), which influences satisfaction, trust, and support for public policies. Despite this relevance, evaluations of e-government systems have rarely adopted a citizen-centric approach. In this study, a novel framework for assessing the quality of e-government services in Indonesia from a UX-driven perspective is developed and empirically validated. A quantitative survey involving 514 active users of licensing, taxation, and environmental management services was administered, and the resulting data were examined using Confirmatory Factor Analysis (CFA) to assess the reliability and validity of the proposed constructs. The results indicate that service quality dimensions play a crucial role in shaping user satisfaction and trust, thereby reinforcing policy legitimacy and fostering citizen participation in support of the Sustainable Development Goals (SDGs). By incorporating UX considerations into the evaluation of digital public services, the study contributes to theoretical developments in digital governance and offers practical insights. The validated framework provides a practical tool for policymakers to enhance public trust, strengthen institutional legitimacy, and improve the sustainability outcomes of e-government initiatives.

Keywords-assessment model; user experience; public trust; sustainable development; e-service

I. INTRODUCTION

Technology has transformed multiple dimensions of daily life, reshaping the ways individuals communicate, access information, and participate in society. Diverse perspectives on this transformation have been highlighted, particularly in the field of e-government, which provides technology-driven solutions, services, frameworks, and applications [1]. E-government can be defined as a government administration system supported by information technology to deliver services to citizens [2]. Beyond its service-oriented function, it also serves as an indicator of government efficiency and a benchmark for digital transformation in public service delivery [3]. Furthermore, e-government contributes to the sustainable

use of natural resources by promoting efficiency and reducing the risk of future environmental degradation [4]. Its relevance becomes even more evident during crises, such as pandemics, when centralized databases and web-connected applications enable governments to maintain service continuity and responsiveness [5].

Electronic-based government systems have evolved, with early scholarly discussions on the role of information technology in governance dating back to the 1970s. However, the modern concept of e-government began to take shape in the 1990s as governments adopted the Internet to enhance service delivery. Since then, digitalization has become a central pillar of public administration reform [6], fostering stronger

interaction between citizens and government officials [7]. Today, e-government is a global trend that generates substantial public value when effectively implemented [8]. It facilitates citizen participation, known as e-citizenship [9], while transparency, usability, and trust improve public acceptance [10]. Recent technological advances have expanded its potential, including AI-driven solutions [11], broader adoption of artificial intelligence in the public sector [12], Explainable Artificial Intelligence (XAI) [13], and blockchain-enabled services [14]. These innovations are associated with greater transparency and reduced corruption [15].

Good governance embodies the principles of openness, efficiency, responsiveness, and accountability in public administration. Digital transformation is a key enabler of these principles and advances the SDGs [16]. Citizens' trust is significant and directly shapes intentions to adopt and use e-government services [17]. Building such trust requires coordinated action among multiple stakeholders with clearly defined roles and responsibilities [18]. Well-designed e-services strengthen the governmental legitimacy and public reputation, advance smart city governance [19], and ultimately support sustainable urban development and long-term governance effectiveness [20].

In Indonesia, although national policies and strategies for e-government development have been established since 2003 [21], their adoption has remained limited and has yet to deliver significant improvements in public service quality [22, 23]. For example, Depok City has not comprehensively evaluated its e-government applications [24], and similar delays have been reported in other local governments [25]. Moreover, many initiatives remain inconsistent with existing regulations. An assessment of privacy compliance revealed that 55% of sampled applications did not meet the required standards [26]. The government also faces persistent technical and organizational challenges in implementing transactional e-government services [27, 28], a fact that contributes to low success rates observed in both international and domestic evaluations [29].

Despite the growing body of research on e-government, implementation outcomes in many contexts remain limited, with persistent technical and quality-related constraints [30]. Citizens frequently perceive that e-government performance falls short of expectations, contributing to low acceptance levels and weak intentions to adopt new services [31, 32]. In Indonesia, several initiatives remain only partially aligned with national policy priorities [33], and institutional and operational barriers have consistently been identified as critical impediments to the effective implementation of e-government programs. These challenges have been reflected in low success rates in local government programs and broader international evaluations [34].

Trusted e-services are essential for strengthening citizens' confidence in the government, thereby supporting the realization of good governance and sustainable development. Accordingly, this study emphasizes the importance of evaluating e-government services from the users' perspective to enhance public trust in Indonesia. A citizen-centric model for assessing e-service implementation is proposed and validated

to address this objective. The study further contributes theoretically by introducing a novel approach to evaluating UX in e-government services through the integration of the Technology-Organization-Environment (TOE) framework [35], the DeLone and McLean (D&M) Information Systems Success Model (ISSM) [36, 37], and the Unified Theory of Acceptance and Use of Technology (UTAUT) [38].

II. THEORETICAL BACKGROUND

A. Trust in e-Government

Trust has emerged as a central concept in e-government adoption research, drawing on insights from multiple disciplines [39]. Citizens' trust in public administration can erode due to factors such as economic downturns, corruption scandals, or breaches of confidential information, often extending to broader distrust in national and supranational institutions, including the European Union [40].

Conceptually, trust reflects public confidence that governments implement policies in the public's and their constituents' welfare [41, 42]. This confidence positively influences the intention and intensity of e-government service use [43]. Effective implementation of e-government requires citizens to place trust in digital service portals, as trust is a key determinant of participation and a foundation for constructive government-citizen relationships [44, 45]. In developing countries, citizens must establish trust in e-government services before adopting them [42, 46].

Authors in [47] demonstrated that higher trust in government is associated with greater use of e-government services, while satisfaction with those services simultaneously enhances trust. Their findings suggest that digital interactions can foster process-based trust and that this trust should be strengthened through greater participatory opportunities. Transparent service delivery further enhances public confidence in governmental institutions [48, 49], and the trust-in-service model has proven to be a practical framework for sustaining these relationships [50].

B. Conceptual Model and Hypotheses Development

The adoption of e-government represents a strategic policy decision that offers greater effectiveness, efficiency, and enhanced public service delivery compared to traditional paper-based systems [51]. Governments worldwide are embracing digital transformation to broaden and improve services for their citizens [52].

Prior research on e-government adoption has been based mainly on established models in Information Systems (IS) and technology, including the Technology Acceptance Model (TAM) [53], the Theory of Planned Behavior (TPB) [54], and the UTAUT, either independently or in combination [55, 56]. Beyond these models, the TOE framework provides a comprehensive perspective for examining the factors that shape the adoption and implementation of new technologies within organizations, so it has been extensively applied to study the assimilation of various IT service innovations [57].

The TOE framework highlights three critical dimensions in the public sector: technological readiness, organizational

capacity, and external environmental support [58, 59]. It has been used to assess, monitor, and manage risks across governance processes [20, 60] and to strengthen stakeholder confidence in initiatives such as smart cities [61]. A growing body of empirical evidence supports the relevance of the TOE framework in explaining technology adoption patterns [62, 63].

Given its integrative nature, the TOE framework is expected to reinforce the impact of e-government services on citizens' trust in the government. By aligning technological, organizational, and environmental factors, the framework can enhance the credibility of digital governance initiatives and contribute to sustainable development outcomes.

- Hypothesis 1: The TOE framework positively influences e-government service adoption, which in turn affects public trust in e-government.

Researchers in [64] have emphasized the relevance of IS theories for addressing the complexities of digital governance, highlighting the need for appropriate conceptual models. Practitioners with knowledge of the ISSM are better positioned to enhance the effectiveness of e-government services [65], particularly through the application of the D&M ISSM [66].

The D&M model has been widely applied and empirically validated in multiple domains, including e-government, where it has been shown to influence user satisfaction and overall system success [67, 68]. The model evaluates three core dimensions: system quality, information quality, and service quality, while allowing integration with additional factors depending on context. Its application in e-government research confirms its value for assessing system performance and citizen satisfaction.

At the same time, scholars have expanded and refined the original D&M framework or offered critical perspectives [69, 70]. Some critics emphasized the need for additional dimensions, while others argued that the model risked being overly complex. DeLone and McLean responded to these debates [71], reviewed subsequent contributions, and proposed an updated version of the model, which remains a cornerstone in IS success research.

Given its established role in evaluating digital systems and its demonstrated applicability in e-government, the D&M ISSM is expected to reinforce public trust in government when its key dimensions are effectively implemented.

- Hypothesis 2: The dimensions of the D&M ISSM positively influence public trust in government policies for sustainable development.

The UTAUT is one of the most widely applied frameworks in IS research, frequently used to explain user adoption of new technologies. It integrates key determinants of technology acceptance, such as performance expectancy, effort expectancy, social influence, and facilitating conditions, which provide valuable insights for analyzing e-government adoption. Authors in [72] applied UTAUT to examine factors influencing citizens' acceptance of e-government services in developing countries, demonstrating its utility in digital governance contexts.

Beyond e-government, UTAUT has been successfully applied across diverse domains, like mobile payment adoption [73], digital assistants [74], and smart city technologies [75], reinforcing its robustness in explaining user behavior across different technological environments. Complementary models, such as TAM, have also been employed in the e-government context, emphasizing perceived usefulness and ease of use as mediating factors [76]. These applications confirm UTAUT's relevance for understanding the determinants of citizen adoption and its implications for trust in government systems.

The current study adopts the UTAUT constructs to investigate how citizens' acceptance of e-government services fosters trust in the government. UTAUT contributes to a deeper theoretical understanding of how digital transformation initiatives enhance confidence in government policies by linking adoption determinants with public trust.

- Hypothesis 3: The constructs of the UTAUT positively influence the adoption of e-government services, which in turn enhances public trust in government policies.

C. Integrated Conceptual Framework and Governance Trust

E-government adoption has been studied through multiple theoretical perspectives, each offering complementary insights into how digital services shape governance outcomes. The TOE framework emphasizes the contextual conditions that influence the adoption and implementation of innovation within public institutions. From this perspective, the effectiveness of e-government initiatives depends on technological capacity and institutional and environmental settings. In this study, TOE is expected to moderate the relationship between adoption and public trust, highlighting how broader contextual factors shape citizen perceptions (H1).

The D&M ISSM provides a system-level perspective by linking the success of digital services with user confidence. Within the e-government context, ISSM provides a theoretical foundation for explaining how the effectiveness of digital services contributes to the building and sustaining of trust in government initiatives (H2).

The UTAUT adds an individual-level perspective by focusing on user acceptance as a determinant of adoption. Applied to e-government, UTAUT helps explain how citizens' engagement with digital services reinforces confidence in government policies and the credibility of digital transformation efforts (H3).

By integrating TOE, ISSM, and UTAUT, this study advances a comprehensive framework that combines contextual, organizational, and behavioral perspectives. Collectively, these approaches explain how adoption processes foster sustainable public trust in government. The integration underscores that trust arises not only from system performance and user acceptance but also from the institutional conditions under which digital services are delivered, offering a multidimensional explanation of e-government outcomes.

Building on these perspectives, it is necessary to acknowledge the overall impact of adoption itself. When citizens adopt e-government services, their trust in governance

processes is reinforced, creating a foundation for advancing sustainable development objectives.

- Hypothesis 4: Adopting e-government services positively influences public trust in integrated governance, contributing to sustainable development.

Integrated Governance Trust (IGT) refers to the level of public confidence in a governance system that coordinates and harmonizes policies, processes, and decision-making across multiple government and private entities. It reflects how well governance is perceived as transparent, accountable, inclusive, functional, and efficient [77, 78]. Citizens evaluate governance quality based on fairness, transparency, and service delivery, and the degree of integration and coordination across agencies.

Such integration strengthens trust by reducing bureaucratic fragmentation, enhancing policy coherence, and increasing accountability. E-government platforms are critical in operationalizing integrated governance by centralizing services, enabling cross-agency data sharing, and ensuring consistent policy implementation. Through these mechanisms, digital governance fosters stronger public trust, which is a crucial enabler of sustainable development objectives.

The integration of these four hypotheses culminates in the development of the Framework of IGT (Figure 1), a conceptual model that interlinks e-government service adoption, public trust, and sustainable development. The IGT framework elucidates how digital government initiatives can reinforce public trust and advance sustainable governance through integrated, citizen-centered approaches. By centralizing services, facilitating cross-agency data sharing, and ensuring consistent policy implementation, e-government platforms effectively operationalize integrated governance. Ultimately, digital governance serves as a critical enabler of public trust and provides a robust foundation for achieving long-term sustainable development goals.

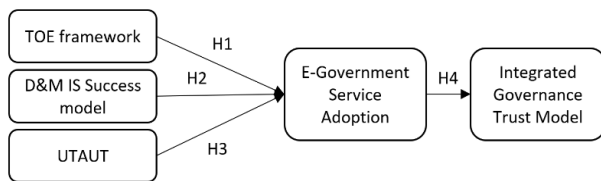


Fig. 1. The Theoretical Framework of IGT.

III. RESEARCH METHOD

A. Methods

Based on the integration of the TOE framework, the D&M ISSM, and the UTAUT, the study proposes a conceptual model that illustrates the relationship between E-Government Services (EGSA) and public trust in IGT for sustainable development (Table I). The model also combines moderation and mediation variables to describe theoretical relationships and guide the development of research hypotheses (Figure 2).

TABLE I. MEASUREMENT ITEMS, RELATED CONSTRUCTS, AND ADAPTED SOURCES

	Construct	Adapted sources for constructs	Items	Item descriptions sufficient
TOE	Organizational readiness	[79]	ORG1	Top management support
		[80]	ORG2	Personnel competent in new technologies
		[81, 82]	ORG3	The organization's favorable attitude toward change
ISSM	System quality	[83]	SQ1	Adaptability
		[84]	SQ2	Availability and privacy
		[5, 15, 85]	SQ3	Reliability and security
		[86]	SQ4	Response time system performance
		[47]	SQ5	Usability
UTAUT	Social influence in technology adoption	[87]	SOI1	Subjective norm
		[2, 10, 45]	SOI2	Social factors
		[88, 89]	SOI3	Improves the user's image
EGSA	E-government services adoption	[90]	EALG1	Effectiveness
		[2, 51]	EALG2	Integration and interoperability
		[41, 91]	EALG3	Continuity
		[92, 93]	EALG4	Efficiency
		[16, 76]	EALG5	Accountability
IGT	Integrated governance trust	[94]	IG1	Integration
		[95, 96]	IG2	Interoperability
		[97-99]	IG3	National data centers

All variables were analyzed using CFA to validate the measurement structure and assess the overall model fit. Within this framework, e-government service adoption is conceptualized as the exogenous variable, while constructs derived from the TOE, ISSM, and UTAUT models function as endogenous variables. These constructs are hypothesized to shape public trust in integrated governance, thereby establishing a clear linkage between the proposed Framework of IGT and the SDGs. The IGT framework primarily advances SDG 16 (Peace, Justice, and Strong Institutions) by promoting trust, transparency, and accountability in digital governance [100]. It also indirectly contributes to SDG 9 (Industry, Innovation, and Infrastructure) and SDG 17 (Partnerships for the Goals) by fostering digital innovation, data-driven collaboration, and inter-agency integration. Collectively, these mechanisms enhance policy coherence and institutional effectiveness, serving as critical enablers of measurable sustainability outcomes.

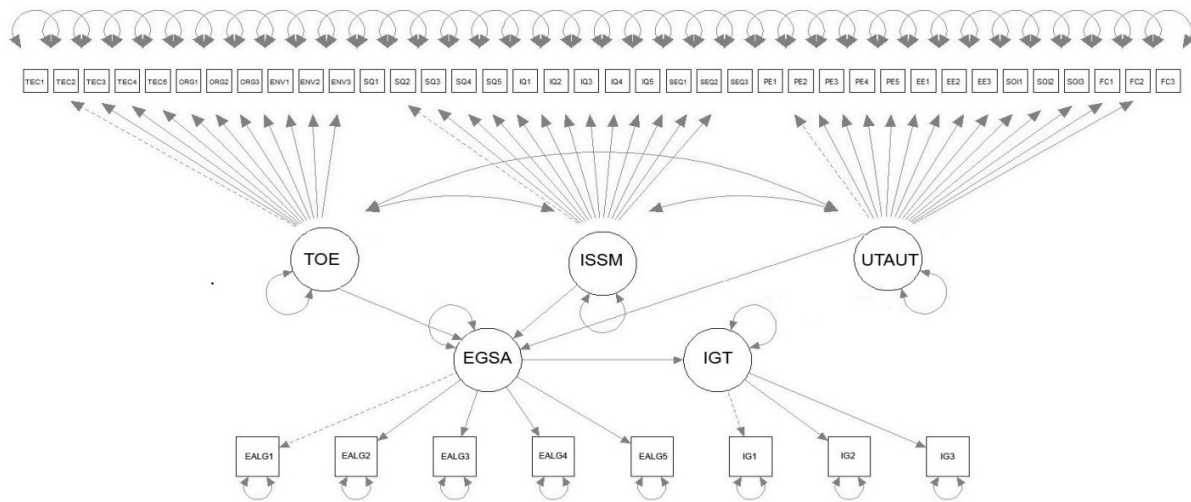


Fig. 2. The proposed model.

B. Measurement

The research instrument was adapted from prior studies. First, the TOE framework was adopted based on the seminal work in [35]. Second, the measurement items were adapted from the ISSM, a framework widely used in e-government studies [94]. Third, the UTAUT was extensively applied to explain the determinants of e-government adoption in developing countries [55]. Collectively, these frameworks provided a comprehensive theoretical basis for developing the survey instrument used in this study.

The structural model assessment using CFA involves four steps: model specification, model identification, model estimation, and model evaluation [95, 96].

C. Data Collecting

A quantitative approach was employed using a survey method. An online questionnaire was administered to students, lecturers, and professionals across various organizations in Indonesia (Table II).

TABLE II. RESPONDENTS' DESCRIPTIVE STATISTICS

Characteristic	Item	Number of respondents
Gender	Male	402
	Female	112
Age	17-25	453
	26-40	37
	41-58	19
	>59	5
Users' experience using the e-service in e-government	<1 year	145
	1-2 years	113
	3-4 years	217
	>4 years	39

Before data collection, respondents were informed of the research's academic purpose and assured of the confidentiality of their identities. The majority of respondents were aged 17-25, with 453 individuals who were predominantly students and those more digitally literate, representing the largest group in

this study. These respondents are expected to provide an overview of the citizen's side of understanding the behavior of e-government adoption [39]. To enhance clarity, a pre-test with 15-20 participants was conducted to ensure that the questionnaire items were understandable and free of ambiguity.

IV. RESULTS

Construct validity was evaluated through convergent and discriminant validity using CFA [97]. Each latent variable was measured using multiple indicators, which were examined through CFA to confirm conceptual validity and minimize potential measurement error [98]. Model fit was assessed using the chi-square statistic and additional goodness-of-fit indices to determine the degree of alignment between the proposed model and the empirical data [99]. Construct reliability was also established to ensure the robustness of the final analysis. Accordingly, CFA was employed to evaluate the hypothesized relationships within the model and to test construct reliability, validity, and unidimensionality [100].

A. Measurement Model Results

The CFA was conducted to validate all latent constructs included in the model. Before hypothesis testing, the reliability and validity of the measurement model were examined. Acceptable thresholds were set at a minimum value of 0.50 for the Average Variance Extracted (AVE) [101] and 0.70 for Composite Reliability (CR) [102]. Each indicator was evaluated to ensure that it adequately represented its corresponding latent construct.

The measurement model was estimated using the maximum likelihood method, and its adequacy was assessed through several goodness-of-fit indices, including chi-square, degrees of freedom, normed chi-square, Goodness-of-Fit Index (GFI), Adjusted Goodness-of-Fit Index (AGFI), Comparative Fit Index (CFI), Normed Fit Index (NFI), Tucker-Lewis Index (TLI), Standardized Root Mean Square Residual (SRMR), and Root Mean Square Error of Approximation (RMSEA). All indices met the proposed criteria, indicating satisfactory convergent validity. All factor loadings exceeded the threshold

of 0.50 and were statistically significant. Overall, the measurement model demonstrated a good fit to the data, with values of GFI=0.894, AGFI=0.858, CFI=0.979, SRMR=0.031, NFI=0.972, TLI=0.975, and RMSEA=0.075.

B. CFA for Assessing the Measurement Model

To evaluate the suitability of the empirical data with respect to the proposed research model, the measurement model was further assessed. This stage focused on examining convergent and discriminant validity for all constructs. Model adequacy was confirmed using commonly reported indices, including GFI, AGFI, TLI, CFI, and RMSEA, all of which indicated that the measurement model was appropriate for this study.

Internal consistency reliability was assessed using Cronbach’s Alpha (CA). The CA values for all constructs exceed the proposed minimum threshold (Table III), indicating satisfactory internal consistency. CR and AVE were also calculated to further establish construct reliability and validity.

TABLE III. CONSTRUCT RELIABILITIES (CR) AND AVE

	CA (standardized)	CR (rho_c)	AVE
EGSA	0.932	0.935	0.740
IGT	0.989	0.989	0.969
ORG	0.994	0.994	0.981
SOI	0.997	0.997	0.992
SQ	0.967	0.966	0.854

All CA values exceeded the proposed minimum of 0.50, as stated in [103], confirming construct reliability. In addition, all CR values were greater than 0.70 and all AVE values exceeded 0.50, indicating strong reliability and convergent validity [100]. These results confirm that the data fit the measurement model well and are suitable for subsequent structural model analysis (Figure 3) such as hypothesis testing.

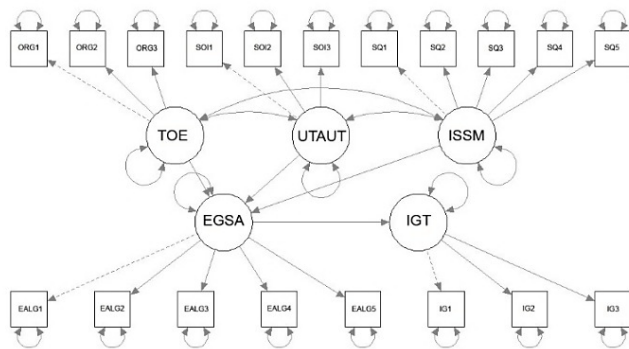


Fig. 3. Structural model results.

Factor loadings indicate the extent to which each observed indicator represents its underlying latent construct (Table IV). Loadings of at least 0.50 are considered acceptable, while values above 0.70 reflect strong relationships and high reliability [102]. Accordingly, factor loadings serve as a key criterion in CFA for validating the measurement model.

TABLE IV. FACTOR LOADING

Constructs	Number of items	Factor loadings
Organizational readiness	3	0.996
		0.987
		0.988
System quality	5	0.903
		0.902
		0.992
		0.915
		0.906
Social influence in technology adoption	3	0.997
		0.994
		0.997
EGSA	5	0.785
		0.897
		0.879
		0.913
		0.819
IGT	3	0.990
		0.980
		0.982

All factor loadings ranged from 0.785 to 0.997, exceeding the commonly accepted threshold of 0.70 and indicating strong convergent validity. Organizational Readiness, Social Influence in Technology Adoption, and IGT exhibited particularly high loadings, confirming that the indicators reliably capture their respective latent constructs. Similarly, System Quality and EGSA demonstrated consistently strong loadings, further supporting the robustness of the measurement model.

C. Hypotheses Testing

The results of hypothesis testing (Table V) indicate that all proposed structural paths are statistically significant, with t-values exceeding the critical threshold of 1.96 [104]. Specifically, the TOE framework with a value of $t = 11.513$, the ISSM with $t = 12.633$, and UTAUT with $t = 12.043$ exert significant positive effects on EGSA. Furthermore, EGSA demonstrates a significant influence on IGT with $t = 12.913$. These findings confirm that all four hypotheses are supported, providing strong empirical evidence for the validity and robustness of the proposed conceptual framework.

TABLE V. HYPOTHESES RESULTS

Hypotheses	Path from	Path to	t-Value	Supported
H1	TOE framework	EGSA	11.513	Yes
H2	ISSM model	EGSA	12.633	Yes
H3	UTAUT	EGSA	12.043	Yes
H4	EGSA	IGT model	12.913	Yes

V. DISCUSSION

The hypothesis testing results indicate that all proposed relationships in the research model are empirically supported. In particular, the TOE framework exhibits a strong and statistically significant influence on EGSA. This finding suggests that organizational factors do not merely play a supportive role but instead act as critical determinants of successful technology adoption in the public sector [79, 80]. Organizational readiness, which encompasses top management support, personnel competence in emerging technologies, and an institutional orientation toward change, emerges as a

significant prerequisite for the effective implementation and acceptance of EGSA initiatives. Accordingly, efforts to accelerate the digitalization of public administration should prioritize strengthening internal organizational capacity, fostering adaptive governance structures, and promoting visionary leadership. From this perspective, the TOE framework underscores that digital transformation should be viewed not solely as a technological endeavor, but as a comprehensive organizational commitment to innovation and change.

The empirical results further demonstrate that the ISSM exerts a significant influence on EGSA. This outcome highlights the important role of system quality in shaping user satisfaction and adoption intentions for e-government services. System quality extends beyond technical functionality to include adaptability [83], availability and privacy [84], reliability and security [5, 14], response time and overall system performance [86, 104], and usability [47]. Collectively, these dimensions indicate that robust system quality is essential for fostering positive user experiences, sustaining user engagement, and ensuring the successful deployment of e-government services within the public sector.

In addition, the UTAUT is shown to significantly influence EGSA, thereby reaffirming the importance of social influence in shaping adoption behavior. Within this framework, subjective norms represent perceived social expectations from colleagues, supervisors, and the broader community, encouraging engagement with digital government services [89]. Social factors, including organizational and peer support, further legitimize the adoption process and enhance user confidence [45]. Moreover, the use of e-government services contributes to an improved user image, as engagement with digital platforms is commonly associated with modernity, professionalism, and alignment with transparency and good governance principles [88, 89]. These findings suggest that acceptance of e-government services is influenced not only by functional considerations but also by social dynamics that shape user identity and societal perceptions. Consequently, the integration of these factors enhances the explanatory power of the UTAUT framework and emphasizes the interdependence of technical, organizational, and social dimensions in digital government transformation.

The empirical testing of Hypothesis 4 confirms that the adoption of EGSA significantly supports the IGT model. This result demonstrates that effective EGSA directly strengthens public trust in governance by improving key organizational and service-related dimensions. Effectiveness is reflected in the government's capacity to deliver accurate, relevant, and responsive digital services. Integration and interoperability enable coordination across governmental systems and agencies, facilitating seamless data exchange and coherent service provision. Continuity ensures uninterrupted access to digital services, which is essential for maintaining citizens' reliance on public platforms. Efficiency is achieved through reduced transaction cost, shorter processing times, and minimized administrative redundancies. Accountability is reinforced through transparent and traceable service processes, collectively enhancing public confidence in governmental

integrity and fairness. These findings provide strong evidence that EGSA functions not only as a mechanism for modernizing public service delivery but also as a strategic driver for building and consolidating IGT.

The initial model developed in this study represents a comprehensive framework integrating multiple dimensions of the TOE, ISSM, and UTAUT models, all of which were hypothesized to influence EGSA and its implications for IGT. The complexity of this model reflects an effort to capture the multidimensional interactions among technological, organizational, system quality, and social factors. However, the model fit assessment revealed that not all indicators contributed meaningfully to the explanation of the latent constructs, indicating potential redundancy and over-specification. As a result, model respecification was undertaken to enhance statistical adequacy, conceptual coherence, and explanatory power.

The respecified model demonstrates improved statistical robustness and theoretical clarity by retaining only those variables that significantly contribute to the relationships among the core constructs. This outcome indicates that EGSA is driven not by a broad set of generalized determinants, but by a limited number of critical factors that directly influence effectiveness, efficiency, and public trust in digital governance. Consequently, the final model provides stronger empirical support for the applicability of the TOE, ISSM, and UTAUT frameworks in the e-government context, while emphasizing the mediating role of EGSA in transmitting these effects to enhance IGT. From a practical standpoint, these findings suggest that policymakers and public institutions should concentrate on reinforcing the most influential organizational, system quality, and social dimensions, rather than allocating resources across less impactful factors, in order to optimize adoption outcomes and strengthen governance trust.

The proposed Framework of IGT aligns closely with the United Nations SDGs, particularly SDG 16, which concerns Peace, Justice and Strong Institutions. By prioritizing transparency, accountability, and citizen-centered digital services, the framework contributes to strengthening institutional legitimacy and public confidence in governance systems. Enhanced trust in e-government services reduces transactional uncertainty, encourages citizen participation, and supports compliance with public policies, thereby advancing sustainable governance. In addition, the IGT framework indirectly contributes to SDG 9, which concerns Industry, Innovation, and Infrastructure, and SDG 17, which concerns Partnerships for the Goals, by promoting digital innovation, data integration, and cross-sector collaboration. Collectively, these mechanisms illustrate how trust-oriented e-government ecosystems enhance institutional performance and serve as critical enablers of long-term sustainable development.

VI. CONCLUSION

This study empirically confirms that the adoption of e-government services is shaped by interrelated organizational, system, and individual factors, as conceptualized through the Technology-Organization-Environment (TOE), Information Systems Success Model (ISSM), and Unified Theory of

Acceptance and Use of Technology (UTAUT) frameworks. Organizational readiness, which is expressed in leadership commitment, personnel capability, and openness to change, is identified as a critical prerequisite for successful implementation. In parallel, system quality is shown to be a decisive determinant of user satisfaction and continued use, while social influence at the individual level reinforces citizens' willingness to engage with digital public services. Collectively, these findings confirm that e-government adoption does not result from a single dimension but emerges from multi-level interactions among organizational, technological, and social factors.

From a theoretical perspective, the study advances existing knowledge by validating a multi-theoretical approach to e-government adoption. The integration of the TOE, ISSM, and UTAUT frameworks illustrates how contextual, system-level, and behavioral perspectives converge to explain adoption processes and their subsequent effects on public trust. The results further demonstrate that adoption extends beyond technological utilization to encompass institutional legitimacy, thereby strengthening Integrated Governance Trust (IGT). By empirically linking adoption mechanisms with governance outcomes and sustainable development objectives, this research addresses a gap in the literature that has been widely acknowledged but insufficiently examined.

From a policy and managerial standpoint, the findings indicate that accelerating digital transformation requires prioritizing the most influential determinants. Enhancing organizational readiness, ensuring reliable and high-quality system performance, and leveraging social influence mechanisms are critical for promoting large-scale adoption. Furthermore, effective e-government adoption contributes directly to improved efficiency, accountability, and policy coherence, thereby consolidating public trust in governance institutions. These results underscore that digital transformation should be approached not merely as a technical initiative, but as a strategic governance instrument that reinforces legitimacy and supports sustainable development goals.

Future research is encouraged to validate the proposed framework of IGT across diverse governance settings and cultural contexts. Longitudinal and cross-national studies may further elucidate how public trust in e-government evolves over time. In addition, the integration of emerging digital technologies, such as artificial intelligence and blockchain, into the framework may offer deeper insights into mechanisms for enhancing transparency, accountability, and sustainable governance.

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