ISSN: 3116-3475
International Journal
of Education, Research, and Innovation Perspectives
Volume 2 Issue 10 (October 2026)

A Digital Transformation Initiative for the Jolo Land Transportation Office

Nuri D. Hamidin
Sulu State University, Sulu, Philippines
Nurihamidin04@gmail.com

Date Submitted:
August 17, 2026

Date Accepted:
September 22, 2026

Date Published:
October 24, 2026

DOI:
10.5281/zenodo.23642031

ABSTRACT

This study examined the challenges, perceived advantages, and implementation requirements of digital transformation in licensing procedures at the Jolo Land Transportation Office (LTO), Sulu, Philippines. Anchored in the Technology Acceptance Model, Diffusion of Innovations theory, and socio-technical perspectives, it used a descriptive mixed-methods design combining stakeholder questionnaires, key-informant interviews, and document review. Participants included licensing applicants, LTO personnel, and community stakeholders; the source manuscript did not state a definitive total number of respondents. Descriptive statistics (weighted means and standard deviations) and qualitative coding were used to organize the evidence. Respondents rated document verification and data-accessibility challenges as very challenging (M = 3.58), alongside workforce and infrastructure constraints (M = 3.63) and data-security and ethical issues (M = 3.67). They agreed with anticipated digitalization benefits for document verification (M = 4.07), workforce development (M = 4.17), and infrastructure resilience and ethical governance (M = 4.27). Ratings were similarly favorable for proposed functionality (M = 4.05), operational readiness (M = 4.11), and infrastructure safeguards (M = 4.05). Interview coding identified process delays, system transition, service improvement, and continuous system enhancement as interconnected priorities. These findings support a phased, security-conscious, and inclusive licensing modernization model combining digital record management, staff capacity building, reliable infrastructure, and accessible service channels. Because reported benefits were predominantly prospective or perception-based, the findings do not establish actual reductions in processing times or improvements in applicant satisfaction after implementation.

Keywords: *digital transformation; Land Transportation Office; licensing services; e-government; service accessibility; digital governance*

INTRODUCTION

Digital transformation has become an important means of improving administrative efficiency, traceability, and citizen access to public services. Yet the ability of government agencies to introduce digital tools is shaped by their technological infrastructure, institutional capability, workforce preparation, and the population they serve. In licensing offices, paper-intensive verification, repeated manual entries, and constrained access to records can prolong transactions and increase the risk of errors. The Jolo Land Transportation Office (LTO) provides a relevant setting for examining these concerns because it operates in a semi-urban, resource-constrained environment in Sulu, Philippines (Reyes, 2020; Santos et al., 2021).

Online appointments, electronic document submission, database integration, and automated verification offer possible ways to improve licensing service processes. However, digital implementation may create additional barriers where internet access, electricity, equipment, staff training, or citizens' digital literacy are uneven. A modernization strategy that disregards these local conditions may reproduce the inefficiencies it seeks to solve or

ISSN: 3116-3475
International Journal
of Education, Research, and Innovation Perspectives
Volume 2 Issue 10 (October 2026)

exclude those who depend on in-person transactions. Digital reform must therefore be understood as a socio-technical and public-value issue, not simply a technology procurement exercise (Heeks, 2017; Cordella & Bonina, 2012; Organisation for Economic Co-operation and Development [OECD], 2020).

The study addressed a localized research gap by examining existing licensing challenges, the perceived benefits and risks of digitalization, and stakeholder views about accessibility, reliability, security, and service improvement at the Jolo LTO. Specifically, it assessed operational bottlenecks in document verification, workforce capacity, infrastructure, and ethics; evaluated proposed digital features and organizational readiness; and developed a context-sensitive digital transformation model. The resulting evidence can inform phased institutional planning and inclusive service delivery consistent with the United Nations' Sustainable Development Goals 9 and 16 (United Nations, 2015).

Literature Review

Digital Government and Public Service Modernization

Research on e-government commonly associates digitally enabled workflows with more accessible records, reduced administrative duplication, and improved service responsiveness. Philippine-oriented studies cited in the source manuscript discuss the value of online service platforms, computerized transactions, and transparent procedures in local offices (Dela Cruz & Bautista, 2019; Garcia, 2018; Villanueva & Ramos, 2019). These accounts suggest that licensing modernization must integrate records, application processing, and applicant communication rather than computerize individual steps in isolation.

The potential benefits are contingent on governance arrangements and institutional context. Ali and Hamid (2019) and Kumar and Singh (2018), as cited in the source manuscript, connect digital public services with stronger operational procedures while emphasizing implementation costs and organizational resistance. Cordella and Bonina (2012) argue that the value of public-sector information technology also involves public trust and societal outcomes, and the OECD (2020) highlights user-centered, data-informed public services. These perspectives support assessing modernization through both administrative and citizen-facing criteria.

Comparable concerns arise in digital government strategies serving non-metropolitan communities. Mendoza and Flores (2020) and Torres (2021), cited in the dissertation, draw attention to uneven readiness, connectivity, perceived security, and user trust. The United Nations Department of Economic and Social Affairs (2020) also emphasize inclusive access. Together, the literature underscores the importance of maintaining assisted alternatives and realistic service expectations where citizens do not possess equivalent technological resources.

Technology Acceptance, Innovation Diffusion, and Organizational Readiness

The Technology Acceptance Model proposes that perceived usefulness and perceived ease of use shape willingness to use information systems (Davis, 1989). For government licensing services, applicants are more likely to accept a digital platform if it makes transactions easier to complete and clearly communicates requirements, while employees need confidence that digital procedures will support, rather than disrupt, their work. Technology acceptance research reviewed by Venkatesh et al. (2016) further situates adoption within organizational and individual contexts.

Rogers' (2003) Diffusion of Innovations theory describes adoption as a progression from awareness and persuasion to implementation and confirmation. Applied to Jolo LTO, this indicates the importance of clear communication, staff participation, hands-on training, early troubleshooting, and visible leadership support. The source study's attention to system transition and public engagement is consistent with the possibility that implementation rates vary between groups with different experience and access to technology.

Adoption is equally affected by conditions beyond individual beliefs. Heeks (2017) emphasizes the fit between technology and developing-context needs, while the OECD (2020) situates digital maturity within strategic governance and administrative capability. In a resource-constrained licensing office, systems planning, workflows, electricity, network availability, data protection, user assistance, and recurrent maintenance are

ISSN: 3116-3475
International Journal
of Education, Research, and Innovation Perspectives
Volume 2 Issue 10 (October 2026)

interconnected. This justifies approaching modernization as a sequence of coordinated institutional changes rather than a single software rollout.

Infrastructure Resilience, Data Protection, and Inclusive Service Delivery

Secure information management is fundamental to licensing because verification involves applicant identities, examination records, and documents that must remain accurate and confidential. The original research identified concerns about biometric equipment, network safeguards, fairness, and data privacy. Public-sector digital governance therefore requires clear controls on access, record integrity, auditing, and system continuity. The public-value perspective also cautions that administrative efficiency alone cannot substitute for accountability and fairness (Cordella & Bonina, 2012).

Resilience also involves supporting people as systems change. Respondents may find online submission convenient while still depending on office personnel for orientation, troubleshooting, or confirmation of requirements. Reports on digital service access indicate that inclusion and institutional responsiveness are essential components of sustainable reform (United Nations Department of Economic and Social Affairs, 2020). Thus, online licensing should be complemented by staff-guided assistance and continuity arrangements during outages or other disruptions.

The reviewed scholarship and study context converge on one implication: a sustainable digital licensing initiative should integrate reliable equipment, accessible digital interfaces, staff and public training, secure record systems, and regular evaluation. The Jolo LTO case extends this discussion by organizing locally reported barriers and expectations into a proposed modernization model. The framework is conceptual and prospective; it does not, by itself, establish that implementation has already produced measurable changes in licensing performance.

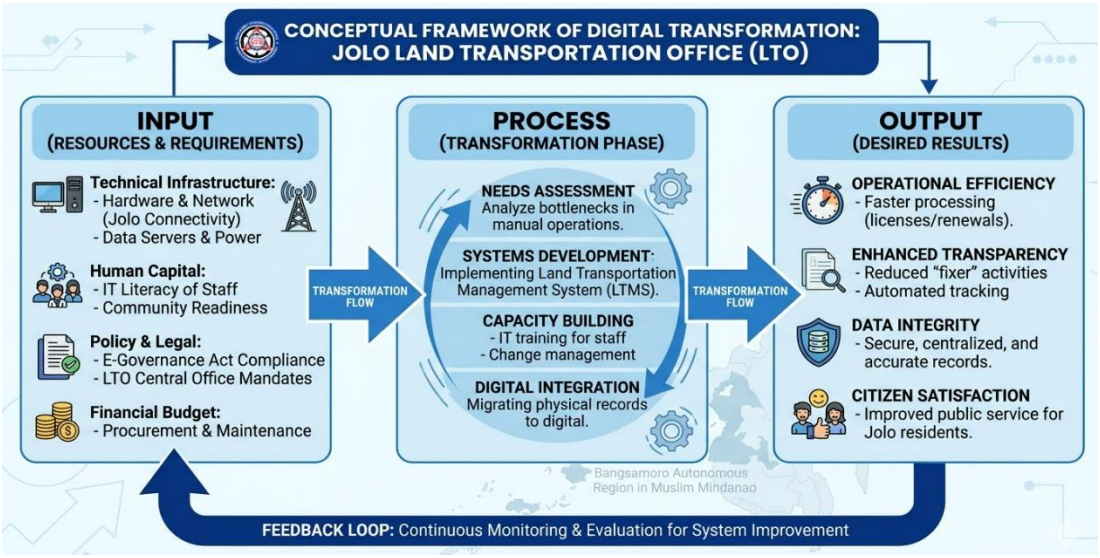


Figure 1. Conceptual framework of digital transformation at the Jolo Land Transportation Office

ISSN: 3116-3475
International Journal
of Education, Research, and Innovation Perspectives
Volume 2 Issue 10 (October 2026)

METHODS

Research Design

The study employed a descriptive mixed-methods research design to examine the challenges of existing licensing services and stakeholder perceptions of digital modernization. Structured survey responses were analyzed quantitatively, while key-informant interviews and documentary sources provided contextual explanations of process delays, system transition, and implementation priorities. The design characterized current conditions and anticipated benefits rather than experimentally testing a completed technology deployment.

Research Locale

The research was situated in the Jolo Land Transportation Office and the Municipality of Jolo, Sulu, Philippines. The office operates within a semi-urban environment where infrastructure limitations, uneven access to digital devices, and differences in user preparedness may affect the adoption of online licensing services.

Participants and Sampling Technique

The participants described in the source included license applicants, Jolo residents and community stakeholders, relevant local officials, and LTO personnel. Purposive sampling was reported for key-informant interviews to include individuals with direct knowledge of licensing operations and proposed modernization. The dissertation also described simple random sampling for the community survey. The source did not consistently state a final total respondent count, response rate, or complete demographic distribution; therefore, no unreported sample size was inferred.

Research Instrument

A structured questionnaire gathered respondents' ratings of existing operational challenges, anticipated digital-system benefits, service features, and institutional readiness using five-point scales. A semi-structured interview guide elicited accounts of licensing bottlenecks, potential reforms, and implementation barriers. The study additionally reviewed relevant government reports, policy documents, and licensing-process records. The researcher described expert assistance and pilot testing in instrument development, although complete validity coefficients and reliability estimates were not supplied.

Data Gathering Procedure

The researcher reported seeking the necessary permissions and coordinating with local authorities. Surveys were administered directly or through trained local facilitators, and key-informant interviews were conducted with relevant stakeholders. With participants' consent, interviews were recorded and transcribed. Documents concerning local service conditions and policies were also reviewed to contextualize responses. Retrieved information was organized for subsequent quantitative and qualitative analysis.

Data Analysis

The quantitative analysis used frequency and percentage distributions, weighted means, and standard deviations to summarize survey responses. The methodology also mentioned chi-square analysis for associations between demographic variables and perceptions; however, corresponding chi-square statistics, degrees of freedom, and p-values were not presented in the detailed findings and are therefore not interpreted here. Qualitative responses were organized using open, axial, and selective coding and summarized as process delays, system transition, service improvement, and system enhancement.

Ethical Consideration

The dissertation reported institutional permission-seeking, participant consent for recorded interviews, and attention to ethical conduct during data gathering. However, it did not supply a verifiable ethics-review

ISSN: 3116-3475
International Journal
of Education, Research, and Innovation Perspectives
Volume 2 Issue 10 (October 2026)

approval number or full details of data retention and anonymization. These administrative details should be checked against the original authorization and consent records before publication.

RESULTS AND DISCUSSION

Existing Challenges in Licensing Operations

The study identified substantial operational barriers to efficient licensing services. Respondents classified document verification and data accessibility (M = 3.5800, SD = 0.62223), infrastructure and workforce capability (M = 3.6333, SD = 0.59673), and infrastructure, data security, and ethical compliance (M = 3.6733, SD = 0.64857) as "Very Challenging." The three domains were assessed on the source's five-point challenge scale. These ratings show that difficulties were not restricted to physical equipment; they also involved staffing, record integrity, fairness, and procedural reliability.

Table 1. *Reported challenges in the current Jolo LTO licensing process*

Dimension	Mean	SD	Original rating
Document verification and data accessibility	3.5800	0.62223	Very Challenging
Infrastructure and workforce capability	3.6333	0.59673	Very Challenging
Infrastructure, data security, and ethical compliance	3.6733	0.64857	Very Challenging

Individual indicators clarify the source of concern. Risk of biased or unfair decisions received a mean of 3.97 (SD = 0.718), heavy workload leading to processing errors received 3.87 (SD = 0.730), and document-authenticity verification and lack of reliable digital tools both received 3.70. Respondents also identified data-security risks (M = 3.67), difficulties retrieving clearance and examination records (M = 3.60), and communication gaps around digital procedures (M = 3.73). These findings indicate that digitization planning must address procedural standards and workforce pressures alongside databases and devices.

The interview coding reinforced these concerns. The selected process-delay theme encompassed resource limitations, misplaced documents, staff shortage, reliance on manual steps, peak applicant volume, and long waiting times. Rather than providing evidence of completed system deployment, these accounts establish a baseline of perceived and experienced inefficiencies against which future interventions could be evaluated. The thematic explanation is consistent with the broader argument that public-sector technology must be fitted to administrative realities (Heeks, 2017; Cordella & Bonina, 2012).

Perceived Benefits and Challenges of Digital Licensing

Respondents favored digital licensing initiatives across the three benefit domains. The mean for document verification and data accessibility was 4.0667 (SD = 0.67330), for workforce development and public engagement 4.1733 (SD = 0.81661), and for infrastructure resilience and ethical governance 4.2733 (SD = 0.54957). Each was interpreted as "Agree" on the original five-point scale. The findings therefore reflect supportive perceptions of proposed changes, rather than a demonstrated difference between manual and implemented digital systems.

Table 2. *Respondents' ratings of potential digital licensing benefits*

Dimension	Mean	SD	Original rating
Document verification and data accessibility	4.0667	0.67330	Agree
Workforce development and public engagement	4.1733	0.81661	Agree
Infrastructure resilience and ethical governance	4.2733	0.54957	Agree

Respondents agreed that secure networks and firewalls could protect licensing databases (M = 4.37, SD = 0.718), biometric and server technologies could strengthen services (M = 4.33, SD = 0.547), and digital systems could improve data protection (M = 4.33, SD = 0.606). They also recognized potential gains from forgery-

ISSN: 3116-3475
International Journal
of Education, Research, and Innovation Perspectives
Volume 2 Issue 10 (October 2026)

detection tools (M = 4.27), staff technical skill development (M = 4.27), and automation to reduce clerical errors (M = 4.23). Comparatively, replacing manual verification with digital signatures attracted a lower but still favorable mean of 3.73 (SD = 1.081), suggesting less uniform agreement on that feature.

Qualitative coding identified system transition as a process involving dependable technology, organized records, adequate staff training, public orientation, and security requirements. Consistent with the Technology Acceptance Model and Diffusion of Innovations theory, perceived advantage needs to be accompanied by usability, gradual introduction, and support for employees and service users (Davis, 1989; Rogers, 2003). Participants' agreement should not be interpreted as proof that automation has already reduced waiting time or errors.

Accessibility, Transparency, and Customer Satisfaction

Three additional dimensions assessed stakeholder expectations for service modernization. Ratings were favorable for desired features and functionalities (M = 4.0467, SD = 0.60271), strategic and operational readiness (M = 4.1133, SD = 0.51911), and infrastructure resilience and ethical governance (M = 4.0467, SD = 0.67402). Together, these results suggest interest in accessible application functions and institutional arrangements capable of sustaining their use.

Table 3. *Perceived features and readiness of digital licensing services*

Dimension	Mean	SD	Original rating
Desired features and functionalities	4.0467	0.60271	Agree
Strategic and operational readiness	4.1133	0.51911	Agree
Infrastructure resilience and ethical governance	4.0467	0.67402	Agree

Specific service features receiving favorable ratings included online upload and verification of legal requirements (M = 4.17), staff capability to operate software (M = 4.20), quality training (M = 4.20), public orientation initiatives (M = 4.20), and system fairness in approval decisions (M = 4.17). Lower indicators within the same favorable range included resilience under high transaction volume (M = 3.90) and cybersecurity strength (M = 3.83). The pattern highlights that users' expectations extend beyond convenience to operational reliability, fairness, and secure treatment of applicant information.

The source's qualitative categories of service improvement and system enhancement supported practical priorities: better communication, remote access, simplified processes, staff support, user-friendly systems, security safeguards, and continuous feedback. These findings align with user-centered digital-government approaches (OECD, 2020) and with the emphasis on accessibility and institutional trust in the United Nations Department of Economic and Social Affairs (2020). Nevertheless, user satisfaction was not measured against a post-implementation comparison group, and statements of actual percentage improvement reported elsewhere in the dissertation were not supported by the tabulated results.

Integration of Quantitative and Qualitative Findings

Table 4. *Cross-cutting qualitative categories and implementation implications*

Source category	Reported issues and responses	Implications for the proposed model
Process delays	Resource shortages; manual processing; misplaced records; queues	Map existing procedures, strengthen records management and staffing
System transition	Automation; staff training; data integration; security	Pilot interoperable services with training and assisted access
Service improvement	Better communication; remote access; fewer steps	Provide accessible applicant-facing channels and track service indicators
System enhancement	Usability; reliability; secure data; feedback	Use regular monitoring, maintenance and privacy controls

ISSN: 3116-3475
International Journal
of Education, Research, and Innovation Perspectives
Volume 2 Issue 10 (October 2026)

The survey and interview evidence converge on the need for phased modernization. Baseline service challenges clarify where workflow change is needed, while favorable expectations identify features stakeholders value. The qualitative results link the two through implementation requirements and ongoing system support. The resulting Digital Transformation Model for Licensing Modernization integrates four elements—process delays, system transition, service improvement, and system enhancement—and proposes continuous institutional learning rather than one-time software installation. This is a proposed model arising from stakeholder evidence, not a tested causal pathway.

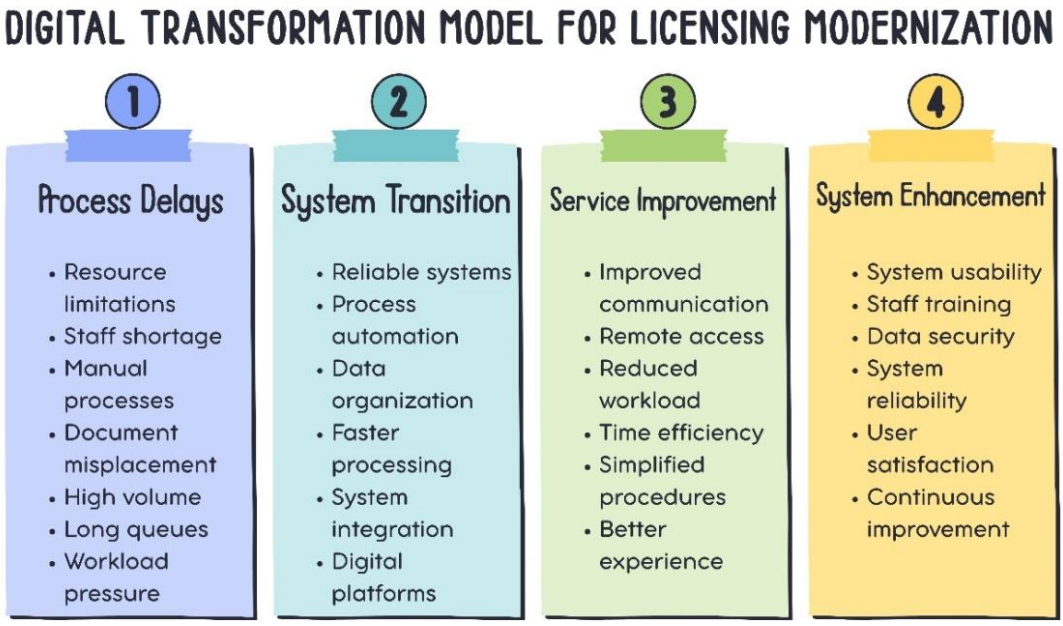


Figure 2. *Digital Transformation Model for Licensing Modernization*

Implementation should begin with a baseline assessment of current queueing times, document errors, transaction volumes, infrastructure outages, and user access needs. The second stage should pilot online scheduling, record retrieval, and assisted electronic submission while training personnel and strengthening cybersecurity. The third stage should document service performance through actual time-and-motion records, error logs, satisfaction surveys, and user feedback. This sequence translates the study's priorities into measurable evaluation activities without attributing unobserved outcomes to the current investigation.

CONCLUSION

The study found that respondents regarded existing licensing operations at the Jolo Land Transportation Office as challenging in document verification, workforce capacity, infrastructure, data security, and administrative fairness. They expressed favorable expectations toward digital systems that could improve records management, staff capability, public accessibility, and procedural transparency. Qualitative themes identified interrelated barriers and implementation needs that informed a proposed four-part Digital Transformation Model for Licensing Modernization. The findings contribute context-specific evidence for planning public-sector digital change in a semi-urban and resource-constrained setting. Because the study chiefly examined existing barriers and perceptions of proposed solutions, actual changes in processing time, applicant satisfaction, or documentation error rates remain to be measured through subsequent implementation and evaluation.

ISSN: 3116-3475
International Journal
of Education, Research, and Innovation Perspectives
Volume 2 Issue 10 (October 2026)

Recommendation

The Jolo LTO should prioritize the documented bottlenecks by reviewing document workflows, standardizing verification and record-retrieval practices, and addressing workloads that contribute to processing delays. Digitalization may be implemented in phases, beginning with a needs assessment and controlled pilots of appointment scheduling, electronic document submission, and integrated records, supported by practical staff training and clear public instructions.

Local leadership and partner agencies should establish maintenance and security responsibilities, including access controls, backup procedures, response plans for connectivity and power interruptions, and consistent review of data-privacy safeguards. Assisted or in-person channels should remain available to applicants with limited connectivity or digital skills to prevent exclusion.

Before wider replication, the office should evaluate the initiative using documented baseline and follow-up data on queueing and processing times, error rates, user complaints, and satisfaction. Future researchers may compare pre- and post-implementation outcomes, analyze adoption among different user groups, and test the proposed modernization model in other resource-constrained transport offices. These steps would establish whether the favorable expectations recorded in this study translate into measurable and sustainable service improvements.

References

Ali, S., & Hamid, A. (2019). Digital government services: Enhancing transparency and efficiency in public administration. Journal of Public Administration and Policy Research, 11(3), 45–56.

Cordella, A., & Bonina, C. M. (2012). A public value perspective for ICT enabled public sector reforms: A theoretical reflection. Government Information Quarterly, 29(4), 512–520. https://doi.org/10.1016/j.giq.2012.03.004

Davis, F. D. (1989). Perceived usefulness, perceived ease of use, and user acceptance of information technology. MIS Quarterly, 13(3), 319–340. https://doi.org/10.2307/249008

Dela Cruz, R. T., & Bautista, L. M. (2019). Computerized transaction systems and organizational efficiency in provincial government offices. Philippine Journal of Public Administration, 63(2), 85–102.

Garcia, M. E. (2018). Online service platforms and public service accessibility in local transport offices. Asia Pacific Journal of Public Administration, 40(4), 302–316.

Heeks, R. (2017). Information and communication technology for development (ICT4D). Routledge.

Kumar, R., & Singh, P. (2018). Challenges and opportunities in implementing digital transformation in government agencies. International Journal of E-Government Research, 14(2), 23–37.

Mendoza, J. P., & Flores, A. R. (2020). Digital readiness and technology adoption in Mindanao-based public institutions. Philippine Social Science Journal, 3(1), 55–68.

Organisation for Economic Co-operation and Development. (2020). Digital government index: 2019 results (OECD Public Governance Policy Papers No. 3). OECD Publishing. https://doi.org/10.1787/4de9f5bb-en

Reyes, M. T. (2020). Digital transformation in semi-urban government offices: A case study on service modernization. Philippine Journal of Public Administration, 64(1), 12–28.

Rogers, E. M. (2003). Diffusion of innovations (5th ed.). Free Press.

Santos, J., Lopez, R., & Cruz, V. (2021). Evaluating digital government initiatives in remote and semi-urban areas: Lessons from the Philippines. Journal of E-Governance and Technology, 7(2), 89–105.

Torres, A. L. (2021). User satisfaction and trust in e-government services in southern Philippine municipalities. Journal of Asian Public Policy, 14(3), 421–437.

United Nations. (2015). Transforming our world: The 2030 Agenda for Sustainable Development. https://sdgs.un.org/2030agenda

United Nations Department of Economic and Social Affairs. (2020). United Nations e-government survey 2020: Digital government in the decade of action for sustainable development. United Nations.

Venkatesh, V., Thong, J. Y. L., & Xu, X. (2016). Unified theory of acceptance and use of technology: A synthesis and the road ahead. Journal of the Association for Information Systems, 17(5), 328–376. https://doi.org/10.17705/1jais.00428

Villanueva, C. P., & Ramos, E. J. (2019). Transparency and accountability mechanisms in Philippine public agencies through digital systems. Asia-Pacific Social Science Review, 19(2), 65–80.