

Optimization of Local Government Information Systems through Digital Governance

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ABSTRACT

Purpose: This study examines the optimization of local government information systems through digital governance in Denpasar City and explores how digital transformation improves public service delivery, transparency, and citizen participation.

Subjects and Methods: The research employed a qualitative descriptive approach using in-depth interviews, direct observations, and document analysis involving government officials, IT staff, and community representatives. Data were analyzed thematically to identify implementation patterns, challenges, and best practices in digital governance.

Results: The findings show that integrated digital platforms have improved administrative efficiency, reduced bureaucratic complexity, and strengthened institutional responsiveness. Digital complaint systems, online licensing services, and open data initiatives increased transparency and citizen engagement. However, several socio-technical challenges remain, including limited digital literacy, infrastructural disparities, organizational resistance, and cybersecurity concerns. Adaptive implementation strategies, collaborative governance, and digital literacy programs were identified as important supporting factors for sustainable transformation.

Conclusions: Digital governance in Denpasar functions as a continuous institutional and societal transformation process that requires technological integration, organizational adaptation, and inclusive governance strategies to ensure effective and sustainable public service innovation.

INTRODUCTION

The digital transformation of governance has emerged as a defining characteristic of contemporary public administration, reshaping how governments deliver services, interact with citizens, and manage institutional accountability. Across the world, governments are leveraging digital platforms to improve transparency, efficiency, and citizen trust (Balaji, 2025). The shift from traditional bureaucratic models to digitally enabled governance frameworks commonly conceptualized as digital governance or e-governance reflects not only a technological adaptation but also a paradigmatic change in the nature of governance itself (AbdulKareem & Oladimeji, 2024; Sharmin & Chowdhury, 2025).

In Indonesia, this transformation has been accelerated by the government's commitment to reform public administration and strengthen democratic accountability through information and communication technology (ICT) (Setiawan et al., 2021; Frinaldi et al., 2024). At the local level, cities are at the forefront of this transformation. Denpasar, the capital of Bali Province, has

become a significant case study for understanding how local governments operationalize digital governance in practice.

As a rapidly urbanizing city with high citizen expectations for efficient public services, Denpasar faces the dual challenge of ensuring administrative efficiency and maintaining inclusivity in access to services (Sanjaya et al., 2025). The optimization of local government information systems (LGIS) through digital governance in Denpasar reflects both progress and ongoing challenges, particularly as it attempts to integrate national frameworks with local realities (Das et al., 2022).

Globally, digital governance initiatives have been linked to several positive outcomes. By enabling transparency and real-time information sharing, governments reduce opportunities for corruption and foster stronger citizen trust (Gartika & Widiyanto, 2024). Information systems that are digitally integrated also contribute to more efficient service delivery, reducing redundancies and streamlining administrative processes (Adityayoga, 2024). Digital tools expand opportunities for citizen engagement, allowing communities to provide input, monitor public projects, and participate in decision-making processes (Susilowati et al., 2025).

While the promise of digital governance is considerable, its realization is not automatic. It requires a complex interplay of technology adoption, institutional adaptation, and citizen capacity (Liu et al., 2025). In Indonesia, digital governance is framed by the national Electronic-Based Government System (Electronic-Based Government System (EBGS), mandated under Presidential Regulation No. 95 of 2018. The policy outlines the need for integrated, interoperable, and citizen-centered digital systems at all levels of government (Marbun et al., 2025). Despite the strong regulatory foundation, implementation at the local level often reveals a gap between policy intentions and practical realities.

Issues such as digital literacy disparities, uneven infrastructure development, limited technical capacity, and bureaucratic inertia continue to undermine the optimization of information systems in many regions (Gravitiani et al., 2025). Denpasar City illustrates this complexity, as its efforts to optimize information systems are both constrained by these challenges and shaped by the city's unique socio-cultural and economic characteristics. One of the critical concerns in optimizing local government information systems is the readiness of bureaucratic structures to embrace change.

Research has consistently shown that the success of digital governance depends less on technological sophistication than on the willingness of public institutions to transform their organizational culture, leadership practices, and administrative routines (Hariyanti et al., 2024). In Denpasar, bureaucratic adaptation to digital systems has highlighted tensions between established practices and the demands of digitally mediated service delivery. These tensions manifest in varying levels of staff readiness, resistance to change, and uneven commitment across departments, all of which complicate efforts to ensure system optimization (Suhartana et al., 2025).

Equally important is the issue of inclusivity in digital governance. While digital platforms can democratize access to government services, they also risk creating new forms of exclusion if segments of the population lack the resources, skills, or infrastructure to engage with these systems effectively (Singh et al., 2025). Denpasar, like many Indonesian cities, faces disparities in digital literacy across socio-economic groups, raising concerns about whether digital governance benefits are equitably distributed. Addressing the digital divide is thus a necessary condition for ensuring that optimization efforts do not inadvertently reinforce existing inequalities but instead contribute to more participatory and inclusive governance (Hamdani et al., 2021).

The optimization of local government information systems in Denpasar must also be understood within the broader context of sustainable urban governance (Megawati et al., 2025; Sumaryana et al., 2024; Sumaryana et al., 2024). As urban populations grow, local governments are under increasing pressure to deliver efficient, transparent, and citizen-responsive services. Digital governance provides a set of tools to meet these demands, but its effectiveness depends on alignment with broader institutional reforms and citizen expectations. Denpasar's experience

contributes to this wider debate by offering empirical insights into how local governments in Indonesia balance technological innovation with organizational realities.

This study therefore situates Denpasar's efforts within a global and national conversation on digital governance. By analyzing how local government information systems are optimized through digital initiatives, the research highlights both the achievements and limitations of digital transformation in practice. The findings underscore the argument that optimization is not a one-time technical intervention but a continuous process of aligning technological capacity, institutional adaptability, and citizen inclusion. Understanding this process in Denpasar provides not only a local perspective but also lessons for other urban centers in Indonesia and comparable contexts in the Global South, where digital governance must navigate similar structural and socio-political constraints.

METHODOLOGY

This study employed a qualitative descriptive research design to capture the complexity of digital governance as it is practiced in Denpasar City. A qualitative approach was chosen because it allows for a nuanced exploration of meanings, perceptions, and experiences that cannot be adequately represented by numerical data. The descriptive orientation provided an opportunity to examine in detail the processes of optimization in local government information systems, highlighting not only the technical aspects of digital transformation but also the organizational and societal dimensions. By focusing on qualitative depth rather than statistical breadth, this research was able to uncover how digital governance is experienced by different stakeholders and how these experiences shape the outcomes of system optimization.

Research Site and Context

The research was conducted in Denpasar City, the capital of Bali Province, which has been recognized as one of Indonesia's more advanced urban centers in terms of administrative digitalization. Denpasar provides a rich case study due to its proactive initiatives in digital governance and the challenges it faces in aligning national digital policies with local needs. The city's socio-cultural context, characterized by both traditional community-based governance structures and rapid modernization, adds further complexity to the digital transformation process. This setting allowed the study to capture the dynamics of digital governance in a context where tradition and innovation coexist, thereby offering insights that extend beyond purely technical considerations.

Sources of Data

Data for this research were drawn from both primary and secondary sources. Primary data were obtained through in-depth interviews and direct observations, while secondary data came from official government documents, policy reports, statistical records, and previous studies on digital governance in Indonesia. The combination of primary and secondary sources ensured a comprehensive understanding of the subject, enabling triangulation of findings and providing greater validity to the conclusions.

Data Collection Techniques

In-depth interviews constituted the main data collection technique. Semi-structured interviews were conducted with a purposive sample of informants that included government officials from the Denpasar City Government, IT staff responsible for system development and maintenance, and community representatives who had direct experience in using the digital services. This purposive sampling allowed the researcher to gather insights from individuals most directly involved with or affected by the optimization of information systems. Interviews were guided by open-ended questions that encouraged informants to describe their experiences, perceptions, and challenges, while also allowing flexibility to probe deeper into emerging themes. Complementing the interviews, direct observations were carried out within government service offices to examine the practical use of information systems and how staff and citizens interacted with digital platforms. These observations provided contextual depth and revealed discrepancies between policy intentions and actual practices. Additionally, document analysis was undertaken by reviewing relevant policy papers, strategic plans, and system usage reports, which offered

valuable background information and helped situate the findings within a broader institutional and policy framework.

Data Analysis

The data analysis followed a thematic approach, which involved organizing, coding, and interpreting the qualitative material to identify recurring patterns and themes. After transcription, interview data were carefully read and coded to capture key categories such as implementation strategies, challenges, citizen responses, and best practices. Observational notes and document reviews were then integrated into the coding framework to cross-validate findings and enrich the interpretation. Through iterative analysis, broader themes emerged that explained the dynamics of digital governance and system optimization in Denpasar. This process allowed the researcher to construct a coherent narrative that linked empirical findings to the study's objectives and contextualized them within the existing body of literature.

RESULTS AND DISCUSSION

This section presents the findings of the study regarding the optimization of local government information systems through digital governance in Denpasar City. The results are organized into three main themes based on the qualitative analysis of interviews, observations, and document reviews: (1) the implementation of digital governance, (2) challenges encountered during implementation, and (3) best practices identified in the optimization process. Each subsection explains how digital governance has reshaped administrative processes, public service delivery, and citizen interaction within the local governance framework. The findings also illustrate that digital transformation in Denpasar is influenced not only by technological readiness but also by organizational adaptation, citizen participation, and institutional commitment. Interview excerpts from participants are included to strengthen the empirical interpretation of the data, while supporting tables are presented to reinforce qualitative findings with institutional evidence and observational records.

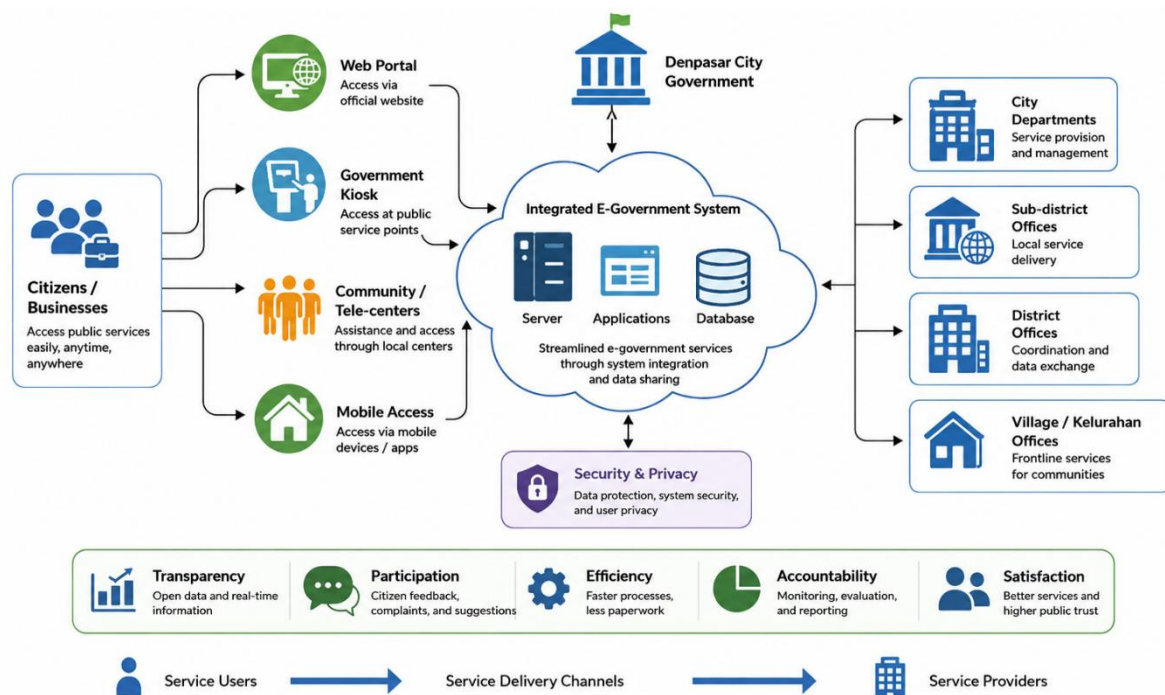


Figure 1. Digital Governance Optimization Framework in Denpasar City

Figure 1 illustrates the Digital Governance Optimization Framework in Denpasar City, demonstrating how citizens, digital access channels, integrated information systems, and government institutions are interconnected within the digital governance ecosystem. The framework shows that citizens and businesses function as the primary users of public services, while access to these services is facilitated through multiple digital channels, including web portals, government kiosks, community tele-centers, and mobile applications. These channels are

connected to an integrated e-government system consisting of servers, applications, and centralized databases that support administrative coordination, data sharing, and service integration across government institutions.

The figure also explains the role of government agencies as service providers within the digital governance structure. City departments, district offices, sub-district offices, and village administrations are digitally connected through the integrated system, allowing information exchange and more efficient service delivery. This integration supports faster administrative processes, reduces bureaucratic complexity, and improves institutional coordination among local government units.

Another important component illustrated in the framework is the inclusion of security and privacy mechanisms. Data protection and cybersecurity function as supporting elements to ensure public trust and maintain the reliability of digital services. The framework further highlights the major outcomes of digital governance implementation, including transparency, citizen participation, efficiency, accountability, and public satisfaction. These outcomes demonstrate that digital governance in Denpasar is not limited to technological modernization but also aims to strengthen responsive and citizen-centered governance practices.

Implementation of Digital Governance in Denpasar City

The findings indicate that the implementation of digital governance in Denpasar City has significantly transformed the administration of public services. The city government has gradually integrated digital systems into licensing, population administration, taxation, and public complaint services. Observations conducted in several government offices revealed that administrative procedures previously dependent on manual documentation are now increasingly managed through centralized digital platforms. This transition has reduced processing delays and improved accessibility for citizens seeking government services.

Interview data further demonstrate that digital governance has strengthened institutional responsiveness and service efficiency. Several participants emphasized that integrated platforms simplify bureaucratic procedures and improve communication between departments.

“Before the online system, people had to move from one office to another just to complete permits. Now most of the process can be checked online. It saves time for both citizens and staff. We still face some technical issues sometimes, but compared to the old process, it is much faster and easier to manage.” (Participant 3 – Government Administrative Officer)

Another participant highlighted that digital governance has encouraged greater transparency in public administration.

“People now can track their applications directly from their phones. Complaints are also recorded digitally, so officers cannot easily ignore them anymore. Citizens usually feel more confident because they can see the progress without repeatedly coming to the office. The system pushes us to respond more carefully and quickly.” (Participant 7 – Public Service Officer)

The implementation process is also reflected in the increasing use of digital platforms by the public. Government reports indicate that approximately 65% of residents actively use digital public services, while 75% of government services have already been digitalized. These findings suggest that digital governance has become a central mechanism in public administration within Denpasar City.

Table 1. Digital Governance Implementation in Denpasar City

Indicator	Findings
Government services digitalized	75%
Residents using digital services	65%
Tourism licenses processed online	80%
Response rate to citizen reports	70%
Citizen satisfaction rate	82%

Source: Denpasar City Government Digital Governance Report, 2025.

The qualitative findings also reveal that digital governance extends beyond administrative efficiency. Participants explained that the integration of digital systems supports transparency and accountability by allowing citizens to monitor government activities more directly.

“Open data and online reporting make departments more careful because everything is visible. People can ask questions immediately if something is delayed. In the past, many processes were unclear to citizens, but now information is easier to access. Even internal coordination between departments becomes more organized.” (Participant 11 – IT System Coordinator)

Field observations additionally showed that digital complaint systems and online portals have become important communication channels between citizens and government agencies. Citizens can report infrastructure problems, licensing issues, and administrative complaints directly through mobile applications. Government staff acknowledged that the visibility of complaints increases institutional pressure to provide timely responses. This condition illustrates how digital governance contributes to a more responsive and citizen-centered administrative model.

Despite these improvements, several participants noted that system integration across departments is still incomplete. Some agencies continue to operate separate databases, resulting in repeated data submissions and coordination inefficiencies. This indicates that the implementation of digital governance in Denpasar remains an evolving process rather than a fully completed transformation.

Challenges Encountered in Digital Governance Implementation

The findings reveal that the implementation of digital governance in Denpasar City continues to face technical, organizational, and social challenges. The most frequently identified issue involves disparities in digital literacy among both citizens and civil servants. Participants explained that older employees and citizens often experience difficulties adapting to digital systems, particularly when administrative procedures require online verification or electronic documentation.

“Younger people usually understand the applications quickly, but older citizens often ask for help directly at the office. Some still prefer manual services because they feel more comfortable speaking face-to-face. We try to guide them, but not everyone is ready to use digital systems independently.” (Participant 5 – Front Office Service Staff)

Observations conducted in public service offices also revealed that some citizens continue to rely on assistance from staff members to complete digital procedures. This situation indicates that technological accessibility alone does not automatically guarantee digital inclusion. Government representatives acknowledged that continuous public education and digital literacy programs remain necessary to ensure equal access to services.

Technical challenges related to infrastructure and interoperability also emerged as significant concerns. Several participants stated that database integration between agencies is not yet fully synchronized, leading to duplicated administrative procedures.

“Sometimes systems between departments cannot connect properly. Citizens already upload documents in one system, but another department still asks for the same files again. Technically the platforms exist, but integration is still incomplete. This creates delays and frustration for users.” (Participant 9 – IT Development Staff)

The issue of infrastructural inequality was particularly visible in peri-urban areas where internet connectivity remains inconsistent. Participants explained that unstable connections often reduce the effectiveness of online services and discourage citizens from relying entirely on digital platforms.

Table 2. Main Challenges in Digital Governance Implementation

Challenge Indicator	Findings
System interoperability level	60%
Citizens facing connectivity barriers	25%

Civil servants with adequate digital literacy	55%
Older citizens preferring manual services	45%
Dependence on external IT vendors	50%

Source: Interview Analysis and Denpasar Digital Governance Evaluation Report, 2025.

Organizational resistance also emerged as a recurring theme within interview findings. Some participants explained that certain government units remain attached to conventional administrative practices and demonstrate limited willingness to adopt digital procedures.

“There are still offices that prefer paper documents because they are used to the old routines. Some staff worry about making mistakes with digital systems, while others think the transition creates more work for them. Adaptation takes time because changing work culture is harder than installing new technology.” (Participant 14 – Senior Administrative Staff)

The findings further indicate that financial limitations affect the sustainability of digital governance programs. Budget allocation for information technology development remains relatively limited compared to other public sector priorities such as infrastructure and healthcare. Participants noted that system maintenance, cybersecurity improvements, and continuous staff training require substantial long-term investment.

Concerns regarding data security also appeared in several interviews. Participants emphasized that citizens increasingly depend on digital systems to manage sensitive administrative information, creating greater institutional responsibility to ensure cybersecurity protection.

“People trust the government with personal data now, so security becomes a serious issue. If systems fail or data leaks happen, public confidence can drop quickly. We continuously improve security, but technology changes very fast and requires constant updates.” (Participant 18 – Information Security Officer)

These findings illustrate that digital governance implementation in Denpasar involves broader organizational and socio-technical challenges rather than purely technological issues. The transformation process requires continuous institutional adaptation, stronger inter-departmental coordination, and expanded digital inclusion strategies to ensure sustainable governance reform.

Best Practices in Optimizing Local Government Information Systems

Despite the existing challenges, the findings identify several best practices that support the optimization of local government information systems in Denpasar City. One important practice involves the development of integrated digital service platforms that centralize multiple administrative functions within a single portal. Participants explained that this integration significantly reduces bureaucratic complexity and improves user convenience.

“The integrated portal helps citizens access many services in one place. They no longer need to visit several offices just to complete simple procedures. From our side, coordination also becomes easier because information can be monitored through one system instead of separate platforms.” (Participant 2 – Digital Governance Manager)

The government’s investment in digital literacy and staff training also emerged as an important success factor. Interview findings show that continuous workshops and mentoring programs have helped improve the adaptability of civil servants toward technological change.

Table 3. Best Practices in Digital Governance Optimization

Best Practice Indicator	Findings
Integrated services through single portal	85%
Civil servants participating in digital literacy programs	75%
Citizens using online complaint systems	65%
Public-private collaboration projects	12 projects
Citizen satisfaction with digital services	88%

Source: Denpasar Smart Governance Monitoring Report, 2025.

Participants additionally emphasized the importance of participatory governance through digital platforms. Online complaint systems, social media communication, and open data initiatives allow citizens to interact directly with government institutions and monitor service performance.

“Feedback from citizens comes very quickly now because people can report issues anytime through applications or social media. Sometimes complaints appear publicly, so agencies feel more responsible to respond fast. The public becomes more involved in monitoring government performance.” (Participant 10 – Public Communication Officer)

The findings also indicate that Denpasar has adopted a gradual implementation strategy by testing digital programs through pilot projects before broader expansion. Participants explained that this phased approach allows government agencies to identify technical weaknesses and improve systems incrementally.

“We usually start with small pilot projects first. If the system works well and people respond positively, then we expand it to other departments. That approach helps reduce risks because we can fix problems early instead of changing everything at once.” (Participant 15 – Smart City Development Officer)

Community-based digital assistance programs also emerged as an important best practice in promoting inclusivity. Several participants explained that local service centers provide guidance for citizens who experience difficulties using online platforms. These initiatives are particularly directed toward elderly residents and lower-income communities with limited technological experience.

The findings therefore suggest that the success of digital governance in Denpasar is strongly influenced by adaptive implementation strategies, institutional collaboration, and citizen-centered service design. The optimization of local government information systems depends not only on technological infrastructure but also on organizational learning, participatory governance, and inclusive public service approaches.

Table 4. Public Utilization of Digital Government Services in Denpasar City

Type of Digital Service	Main Function	Average Monthly Users	User Satisfaction (%)
Online Licensing System	Business permits and administration	12,500 users	84%
E-Population Administration	Identity card and family card services	9,800 users	81%
Digital Tax Payment Platform	Local tax payments	7,400 users	79%
Online Public Complaint System	Citizen reports and complaints	5,600 users	80%
Open Data Portal	Public information access	3,500 users	76%

Source: Denpasar City Smart Governance Monitoring Report, 2025.

The online licensing system records the highest level of public utilization, indicating that citizens strongly depend on digital platforms for administrative efficiency and business-related services. The high satisfaction rate also suggests that users perceive digital licensing services as faster and more transparent compared to conventional procedures. Population administration services similarly show substantial public engagement because citizens frequently require identity verification and civil registration documents for various administrative purposes. The relatively lower usage of the open data portal indicates that participatory information access is still less dominant compared to practical administrative services. Nevertheless, the findings confirm that digital governance platforms have become increasingly integrated into citizens’ daily interactions with government institutions.

Table 5. Interview Coding Results on Digital Governance Themes

Main Theme	Number of Coding References	Dominant Issues Identified
Administrative Efficiency	28 references	Faster services and reduced bureaucracy
Transparency and Accountability	21 references	Open monitoring and complaint tracking
Digital Literacy Challenges	18 references	Limited technological skills
Infrastructure Limitations	16 references	Internet instability and access gaps
Organizational Resistance	14 references	Adaptation difficulties among staff
Citizen Participation	20 references	Increased public interaction through digital platforms

Source: *Qualitative Coding Analysis using Interview Transcripts, 2025.*

The dominant themes emerging from thematic coding analysis. Administrative efficiency appears as the most frequently discussed issue among participants, reflecting the central role of digital governance in simplifying bureaucratic procedures. Transparency and accountability also emerge strongly because digital systems allow citizens to monitor administrative processes more directly. Challenges related to digital literacy and infrastructural inequality remain significant concerns, particularly regarding inclusivity in service access. The coding results further show that citizen participation has increased through digital communication platforms, although institutional adaptation challenges continue to influence the effectiveness of implementation.

Table 6. Observational Findings from Government Service Offices

Observation Aspect	Field Findings
Service Queue Duration	Reduced compared to manual procedures
Citizen Interaction with Digital Kiosks	Frequently assisted by staff for elderly users
Inter-departmental Coordination	Improved but still partially fragmented
Public Complaint Handling	Faster response through integrated platforms
Availability of Digital Information Boards	Present in most service offices

Source: *Field Observation Notes, 2025.*

The observational findings confirm that digital governance has improved operational efficiency within government offices. Shorter service queues and faster complaint handling indicate the effectiveness of integrated digital systems in simplifying administrative workflows. However, direct observations also reveal that many elderly citizens still require assistance when interacting with digital kiosks and online platforms, supporting interview findings regarding digital literacy disparities. Coordination between departments has improved through digital integration, although fragmentation remains visible in certain administrative processes.

Discussion

Digital Governance as a Mechanism for Administrative Efficiency and Institutional Transformation

The findings demonstrate that digital governance in Denpasar City has evolved beyond a technological modernization initiative and functions as a mechanism for institutional transformation within local public administration. The implementation of integrated digital systems has significantly reshaped administrative workflows, communication patterns, and public service delivery processes (Das, 2024; Wouters et al., 2023; Mangai & Ayodele, 2025). The qualitative evidence indicates that online licensing systems, population administration platforms, digital complaint mechanisms, and integrated databases have reduced bureaucratic complexity while improving service accessibility for citizens.

The results align with the argument that digital governance supports the transition from conventional hierarchical bureaucracy toward a more responsive and citizen-oriented governance model. Interview findings reveal that citizens can now access services more efficiently through web portals, mobile applications, and digital kiosks without depending entirely on face-to-face administrative procedures. The reduction of service queues and administrative delays observed in government offices further confirms that digital integration contributes to operational efficiency and institutional responsiveness. The findings therefore reinforce previous studies emphasizing that information system integration enhances coordination, reduces procedural duplication, and accelerates public service processes.

Paselle et al. (2025) and Berch et al. (2024) said that, transparency also emerged as a central outcome of digital governance implementation. Participants explained that open data systems and online complaint platforms increase institutional accountability because administrative processes become more visible to citizens. This visibility creates stronger public oversight and pressures government agencies to respond more consistently to citizen reports and service requests. The coding analysis showing strong references to transparency and accountability further strengthens this interpretation. Digital governance in Denpasar therefore illustrates how technological systems can function as instruments for strengthening public trust and administrative legitimacy.

The findings additionally reveal that citizen participation has become increasingly integrated into governance practices through digital platforms. Complaint systems, online reporting mechanisms, and social media communication channels provide opportunities for citizens to interact more directly with government institutions. This condition reflects the emergence of participatory governance where public interaction is no longer limited by physical administrative boundaries. The increased use of digital services by residents also indicates that digital governance has gradually become embedded within daily administrative activities and urban management practices in Denpasar.

Despite these achievements, the implementation process remains incomplete because institutional integration across departments is still partially fragmented (Rohracher et al., 2023; Asha & Makalela, 2020). Several participants noted that separate databases and inconsistent inter-agency coordination continue to create inefficiencies in service delivery. This finding suggests that digital transformation within local governance requires continuous institutional adaptation rather than isolated technological adoption. Administrative reform therefore depends not only on the availability of digital infrastructure but also on the ability of government institutions to integrate organizational processes, standardize information systems, and strengthen collaborative governance practices.

The findings also indicate that leadership commitment and adaptive implementation strategies play important roles in supporting institutional transformation. The gradual adoption of pilot projects before large-scale implementation allows government agencies to evaluate technical limitations and organizational readiness more effectively. This phased approach reduces institutional resistance and supports long-term sustainability within the digital governance ecosystem. Consequently, digital governance optimization in Denpasar reflects an evolving process of organizational learning where technological innovation, administrative reform, and citizen-centered governance are interconnected within broader institutional transformation efforts.

Socio-Technical Challenges and Inclusive Governance in Digital Transformation

The study findings reveal that the optimization of local government information systems in Denpasar City is influenced not only by technological capacity but also by broader socio-technical and organizational factors. One of the most dominant challenges identified through interviews and observations involves disparities in digital literacy among citizens and civil servants. Older citizens frequently experience difficulties when interacting with digital systems, particularly in completing administrative verification procedures or navigating online service platforms. Observational findings further confirm that elderly service users often depend on direct assistance from government staff when using digital kiosks or online applications. These

conditions indicate that technological accessibility alone is insufficient to guarantee equal participation in digital governance.

The persistence of digital literacy disparities highlights the importance of inclusive governance strategies within digital transformation initiatives. The findings demonstrate that citizens with stronger technological familiarity adapt more easily to online systems, while vulnerable groups remain dependent on conventional administrative support. This situation creates the risk of unequal service access where digital governance may unintentionally reproduce social exclusion if institutional support mechanisms are inadequate. Community-based assistance centers and public digital literacy programs therefore become essential components in ensuring that technological modernization remains socially inclusive (Anuyah et al., 2023; Islam et al., 2024; Ningrum, 2025).

Technical and infrastructural limitations also continue to constrain the effectiveness of digital governance implementation. Participants repeatedly emphasized that interoperability between government databases remains incomplete, resulting in duplicated administrative procedures and fragmented service coordination. Internet instability in peri-urban areas further reduces the reliability of online services and discourages consistent public utilization of digital platforms. The findings therefore suggest that the success of digital governance depends heavily on the integration of infrastructure development with institutional coordination and technological standardization.

Organizational resistance represents another significant challenge identified in this study. Several government units continue to rely on paper-based administrative routines because some employees perceive digital systems as complicated or disruptive to established workflows. These findings support the perspective that bureaucratic transformation is fundamentally a cultural and organizational process rather than a purely technical intervention. Institutional resistance emerges not because technology is unavailable, but because organizational adaptation requires changes in work culture, administrative habits, and professional competencies. Continuous staff training and leadership support are therefore critical for strengthening institutional readiness and reducing resistance toward digital transformation (Veseli et al., 2025; Chavarnakul et al., 2025; Valtonen & Holopainen, 2025; Komna & Mpungose, 2024).

Data security concerns additionally emerged as an important issue influencing public trust in digital governance systems. Participants acknowledged that citizens increasingly depend on digital platforms to manage sensitive administrative information, creating greater institutional responsibility regarding cybersecurity protection. Weak security systems or data breaches may reduce confidence in government digital services and undermine the legitimacy of digital governance initiatives. This finding indicates that sustainable digital transformation requires balanced attention toward efficiency, accessibility, and data protection within integrated governance systems.

The findings also reveal that Denpasar has attempted to address these socio-technical challenges through adaptive and collaborative governance strategies (Bharoto et al., 2025; Pramesti et al., 2025). Public-private partnerships, digital literacy programs, integrated service portals, and phased implementation approaches represent important institutional responses aimed at strengthening sustainability and inclusivity. The existence of collaborative projects with external institutions further demonstrates that digital governance increasingly operates through network-based governance models rather than isolated bureaucratic structures. Such collaboration supports technological innovation while expanding institutional capacity within local governance systems.

The discussion therefore confirms that digital governance optimization in Denpasar City should be understood as a continuous socio-technical transformation involving institutional adaptation, citizen participation, organizational learning, and inclusive governance practices. The effectiveness of local government information systems is shaped not only by technological infrastructure but also by the ability of institutions to balance efficiency, transparency, inclusivity, and public trust within the broader process of administrative reform.

CONCLUSION

This study concludes that the optimization of local government information systems through digital governance in Denpasar City has significantly improved administrative efficiency, transparency, citizen participation, and public service responsiveness. The implementation of integrated digital platforms has transformed conventional bureaucratic processes into more accessible and citizen-centered governance practices, while also strengthening institutional accountability through open information systems and digital communication channels. However, the findings also reveal that the sustainability of digital governance remains influenced by several socio-technical challenges, including digital literacy disparities, infrastructural limitations, organizational resistance, and cybersecurity concerns. The success of digital transformation in Denpasar therefore depends not only on technological infrastructure but also on institutional adaptability, collaborative governance, continuous capacity building, and inclusive public service strategies. These findings demonstrate that digital governance functions as an ongoing process of organizational and societal transformation rather than merely a technological modernization initiative.

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