

Digital governance and public service accountability: Insight from the population and civil registration office in Makassar, Indonesia

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Abstract

This research aims to explore the relationship between the applicability of digital governance in improving public service accountability and how data integration is implemented in the application of digital technology at the population and civil registration office of Makassar City. The highlighted issue is how service digitization contributes to transparency, efficiency and integrated public accountability. The research used an explanatory qualitative approach; which consisted of data collection techniques through in-depth interviews, review and analysis of official documents on digital-based service reports and direct observation of digital service platforms. Data analysis was conducted interactively through the stages of data reduction, data presentation, verification and and conclusion. The findings showed that digital governance at the population and civil registration office of Makassar City has improved to adapt to digital technology, thereby increasing effectiveness and public access to services. However, several improvement notes need to be improved, such as; aspects of data sustainability and security still require strengthening at the institutional level, increasing the capacity of human resources, and policy integration between local and national levels. Through comparisons with local research and with best practices at the global level, this research has reconstructed some concepts of e-government and good governance, while highlighting the need for appropriate adaptation to the local context. The contribution of this research consists in identifying and mapping the practical and normative challenges in implementing digital transformation in the public service sector at the local level.

Keywords: digital governance, accountability, public services, policy, digital transformation

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Introduction

Information and communication technology as a tool for stakeholders to interact directly with the community and monitor what is happening in people's lives, how cities develop, and how to create a better quality of life (Wahyuni et al., 2021). According to Erwati (2022) that the main thing in providing electronic services provided by the government that needs to be considered is the quality of service. In the implementation of public services in the government sector, it is very important, particularly in Makassar City, which is considered a solution in accelerating the service process and increasing accessibility for the community by utilising technology, the public can access services more quickly and transparently. The development and advancement of information and communication technology is very complex and fast, so people now expect more efficient and transparent public services.

The population and civil registration office must be able to improve efficient and transparent services to the community. However, the manual process that is still

widely used in population administration is often prone to errors, slow, and less transparent. Therefore, the use of electronic-based systems is expected to increase accountability and effectiveness of services. As explained in Presidential Regulation of the Republic of Indonesia Number 95 of 2018 concerning Electronic-Based Government Systems to improve clean, effective, transparent, and accountable governance and quality and accountable public services, a technology-based government system is needed. According to Melinda et al., (2019) that in Indonesia, bureaucratic public services often have a negative stigma, such as convoluted procedures, unfriendly attitudes, unfair, non-transparent and tend to complicate and slow down services. In addition, the emergence of illegal levies and bribery practices is also a frequent problem. It is understood that the Indonesian government is trying to reform the bureaucratic sector by utilising application-based technology, this is a reference in this study to look at the service aspects of service accountability launched to the community at the population and civil registration office of Makassar City, so as to assess the extent to which the effectiveness of the services provided in accordance with existing regulations.

Overall, digital governance in Indonesia faces various challenges, (Prihatmanto et al., 2024) the main challenges faced include data security issues, limited technological infrastructure, and resistance to change within government organisations. Farida & Lestari (2021) identified three main problems in implementing E-Government, and one of them is culture, which is a significant challenge. Firman & Hakim (2024) emphasises the various ethical challenges faced in digital governance, with a particular focus on issues of data privacy, information security, and algorithmic bias. On the other hand, if analysed, the main problem with the current condition is the fragmentation of systems between institutions, meaning that there are still many government agencies that have their own digital systems, making it difficult to integrate data and make it difficult to exchange data between institutions, causing data duplication and making it difficult to provide services. then the limitations of technological infrastructure, low human resource capacity, lack of training for state civil apparatus in this case employees in digital systems are one of the main challenges. In addition, low digital literacy among the public also hampers the utilisation of e-government services and weak coordination and data integration among agencies. In addition, data security and privacy issues are also important problems that have not yet been fully addressed. Salam et al., (2024) revealed several challenges in improving the resilience of digital governance, including budget constraints and lack of trained human resources. In Aceh, e-Government services from some government organisations do not improve the economic and social life of the community. Instead, these services create exclusivity and technological gaps, making the government continue to work manually (Aminah & Saksono, 2021). The lack of digital literacy among the public and the unoptimised complaints and feedback system in digital services further worsen the quality of public services.

Seeing the current dynamics of the service process carried out at the population and civil registration office, the service conditions are still found in various services that are manual systems to solve community needs. According to data obtained from the population and civil registration office of Makassar City, the number of visitors in a day reaches around 250 people, each with various administrative service needs. This condition makes the service office look crowded, and often citizens are forced to jostle in it . This indicates that digital governance is not yet significant with various application systems available. Data submitted by the Ombudsman shows that in 2019 there were

11,087 complaints related to public services, with 41.03% of them being complaints about service quality (Fitri & Pradana, 2022). Meanwhile, in 2020, the Indonesian Ombudsman received 7,204 reports, of which 31.57% were related to delays, 24.77% were about procedural irregularities, and 24.39% were cases where services were not provided. With the implementation of SIAK, it is expected that various problems such as the complexity of the administrative process, data inaccuracies, and delays in processing population documents can be overcome more efficiently (Andika & Agustiono, 2024). However, in practice, the implementation of SIAK often faces various obstacles. Among these are the limitations of technological infrastructure, the lack of training for officers, and the difference between user expectations and the performance of the existing system (Saputra, 2025). Another issue is the lack of response to public complaints. In fact, population services are one of the basic services that are very essential and have a direct impact on people's lives. Based on the results of a survey conducted by the population and civil registration office of the city of Makassar with a data collection method through a public satisfaction survey on services in 2023, 384 respondents with various characteristics were seen, it was found that the public satisfaction index for the services of the population and civil registration office of the city of Makassar was 87.40% with good service quality. This is also indicated by eight elements that have a good predicate. However, it was found that the element that had a low score was the element of handling complaints, suggestions and input with a value of 3.43%. So that the results of this survey found that the GAP analysis between performance (satisfaction) and expectations of services provided by the population and civil registration office of Makassar city has a negative value of 3.77%, which means that the quality of service has not met all the expectations of service users because there are still unfriendly service officers, queuing systems that are not appropriate and long, online service procedures are still not understood and officers do not direct when performing services, service officers are less competent in their duties so that the community is less helpful and has difficulty in applying for services, online services are difficult for the elderly to understand, and ktp services are not equipped with fingerprint and eye sensors, making it difficult for the community. In accordance with the above problems, other problems were found based on the results of field analysis that the integration of data continuity between the government, in this case the sub-district and kelurahan, is not well accommodated based on the application that has been launched by the population and civil registration office of the city of Makassar, causing data inaccuracies, data duplication and can even cause new problems.

This problem indicates that digital governance has not been optimised in the service process, not to mention the accountability aspect, so this is an interesting study to be examined comprehensively. By utilising modern information systems and technology, e-Government is able to fulfil information needs in government management, so as to improve administrative processes and ensure public accountability (Utama, 2020). Electronic Government has the aim of making it easier for people to access public services, information sources are easier to access, service improvements can be enjoyed equally by all citizens, and problems regarding public complaints can be handled. Wulan et al., (2023) says Electronic government is not about installing computers or building internet sites in search of information, but about changing the fundamental relationship between government and the public, changing government service information through the use of technology. Therefore, transparency is needed by public organisations with the aim of becoming a basis for providing explanations to all parties (stakeholders), both internal and external, who

have an interest in evaluating or assessing the actions and performance carried out by the public organisation (Herizal et al., 2020). In line with the World Bank that E-Government needs to focus on empowering the community by providing broad access to available information (Lenak et al., 2021).

If we look at the current issues that are being studied related to digital governance and service accountability, the most basic issue is data discrepancies in the population administration information system (SIAK) such as long and long queues, population data is sometimes out of sync and the response to public complaints is low. This shows that the digitalisation of population data has not been optimal, which has an impact on slow and inaccurate services, reflects the low efficiency of services and the potential for system overload due to queue management and service distribution is not optimal, then the lack of response to complaints indicates a lack of accountability and public participation in monitoring services and can reduce public trust. In more detail, a visual representation based on the issues that develop in the population and civil registration office of Makassar City can be depicted in Table 1.

Tabel 1. Visual representation based on the issues that develop in the Population and Civil Registration Office of Makassar City

Problem	Causes	Impact
Data Discrepancies	SIAK system is not yet fully integrated	Services delayed, public trust declines
Long Queues	Manual or online queuing system is not optimal	Low efficiency, high waiting time
Slow Response	Grievance channels are not actively managed	Low public satisfaction

Data source: data processed by researchers 2024

This picture shows that the quality of good public service delivery is certainly one of the indicators that affect public satisfaction as a recipient of public services. The benefits of public services are essentially to satisfy and fulfil needs in accordance with the wishes of society in general. In theory, service is known through consumer behaviour, especially the behaviour of those served in searching for, purchasing, accessing and studying a good or service in the hope of meeting the needs of the customer itself. Essentially, service is a series of activities that take place continuously and involve all aspects of people's lives, so it can be considered a continuous process (Lumi et al., 2019). In the context of globalisation and inter-regional competition, the population and civil registration office of Makassar City is faced with the demands of implementing high public service standards. Delays or inaccuracies in service can have a negative impact on the image and reputation of the government.

The general problem that often arises in the implementation of public services is the lack of transparency and accountability in the provision of services. Manual systems are vulnerable to various forms of fraud and abuse, such as illegal levies, data manipulation, and other irregularities, in line with research Sitti & Dian (2022) that the principle of accountability has not been running in accordance with regulatory provisions because website servers containing information and accountability for public reports are still often down, there are still unscrupulous service employees who commit illegal levies, and there has been no firm action against unscrupulous employees who commit acts of KKN, causing the synchronisation of data collection to be needed sometimes not in accordance with what exists and becomes an obstacle when there is an overall data adjustment, Musabry et al., (2021) regarding the population services of

the population and civil registration office in Makassar City, there are other realities in the field. There are still people who complain about the complexity and incompatibility of services provided by related institutions, especially those related to population administration such as making birth certificates and processing death certificates. The process is considered complicated and less transparent for the community, with unclear administrative requirements, procedures that are not open, and issues of fairness in services. In addition, awareness of and access to civil registration data remains a significant obstacle. Limited human resources and technology, so large-scale implementation requires people with expertise in information technology. In addition, limited information technology infrastructure and budget availability are also obstacles in implementing electronic-based solutions as a whole. This is a problem in the service process so that it requires seriousness to improve service accountability by using an automated and well-documented electronic system.

Although there have been many studies that discuss the issue of accountability of electronic-based public services at the population and civil registration offices, they have not comprehensively discussed aspects of the main problems that are obstacles so that there are still shortcomings, such as research conducted (Ulin & Aisyah, 2023).

One of the issues faced is the lack of integration between performance accountability systems and national planning. In addition, the low ability of human resources also has an impact on service quality, which has the potential to cause dissatisfaction among the people who use the system. Based on Al-Shbail & Aman (2018) implementation of e-government to improve accountability is still unclear and involves many complex processes due to the irregularity of dual accountability. Therefore, if you look at the conditions that occur in other countries with the same problem research said that the accountability and governance dilemma in Nigeria illustrates that one of the main problems that hinder public service delivery is the habit of government and civil servants (Adejuwon, 2012). This is in accordance with the objectives in this study by looking at and observing the service process carried out by employees to the community at the population and civil registration office. this study aims to fill the void with a more in-depth approach to see its effectiveness, continuity and data security accompanied by supporting variables and indicators. Therefore, it is important to conduct a more in-depth study on the implementation of digital governance practices and the extent of its impact on improving accountability in public services, especially in the civil registration sector. The present study has high relevance as a contribution to strengthening the implementation of effective, accountable, and community-focused digitalisation of services.

Research Methods

This research uses a qualitative approach with the explanatory type, which is a robust method for understanding causal relationships in various observable features. By using descriptive qualitative methods, researchers can capture context, meaning, and social reality that is difficult to express only through numbers or statistics. As a research strategy, a case study was chosen by considering the complexity and uniqueness of the local context. The study focused on one institutional unit to gain a comprehensive understanding of digital governance mechanisms and accountability in civil registration practices. Researchers in case study research collect a large amount of data to build a deep understanding of a case. Data collection is done through in-depth interviews, direct observation, and documentation studies. Informants were purposively selected, including structural officials, technical staff, and digital service users. To improve the

validity of the data, source and technique triangulation techniques were applied, while validation of the findings was done through member checks by confirming the results of initial interpretations with informants.

Data analysis takes place interactively through the stages of data reduction, data presentation, and conclusion drawing/verification, and is conducted more systematically and accurately (Fadli, 2021). This process aimed to identify key themes related to the dimensions of digital governance, transparency, responsiveness, and accountability in public services. To avoid the researcher's subjective bias, the validity of the interpretation was strengthened through peer debriefing. The data was grouped based on the main themes related to the accountability dimension, which refers to the Presidential Regulation of the Republic of Indonesia Number 95 of 2018 explained to achieve the objectives of clean, effective, transparent, and accountable governance, as well as quality and trustworthy public services. It is necessary to implement an electronic-based government system, by looking at the principles of its implementation in article 2, namely effectiveness, sustainability, and data security so as to measure indicators on aspects of accountability, responsiveness, clarity of procedures, and complaint mechanisms. With this approach, the researcher seeks to produce a contextual, in-depth, and relevant understanding of digital governance practices and accountability challenges in public services at the local level.

Results and Discussion

The issue of administrative management in Makassar City has drawn numerous complaints from the community, particularly regarding prolonged service times caused by queue buildups. This inefficiency stems primarily from the inadequate management of information, which significantly hampers the service delivery process. Additionally, the disorganized flow of administrative procedures between sub-district and village-level governments contributes to the problem, as there is a lack of a well-defined and efficient mechanism to ensure that services are delivered accurately and in accordance with community needs.

To address these challenges, the Makassar City Government must enhance its administrative management system by leveraging information and communication technology (ICT), particularly the internet, as a platform for public service delivery. The adoption of digital governance is essential for improving both the quality of services and public access to information. One critical area requiring attention is the provision of information and population administration services through population and civil registration office. This office must streamline and expedite digital service access in alignment with existing policy frameworks to ensure effective accountability.

Furthermore, the availability of adequate digital technology and electronic information infrastructure is vital. Such resources not only enhance the effectiveness, efficiency, and flexibility of public services but also ensure that these services are accessible and responsibly managed. The primary goal is to foster result-oriented public services that meet the expectations of the community.

Field observations and qualitative data collected from informants reveal that manual service delivery remains prevalent and is characterized by long queues and suboptimal effectiveness. These issues are exacerbated by frequent system errors, which further hinder service delivery. Therefore, a clearer understanding of the situation can be derived from the initial findings of this study, as presented in Table 1, which summarizes the results based on the aspects of effectiveness, sustainability, and data security.

Table 1. Synstesis of Research Results

Aspect	Interview Findings	Observation Results	Interpretation
Effectiveness	Online service systems such as SIAK, <i>Kucatatki</i> and digital service applications speed up the process of registering births, reporting deaths and complaints, recording and printing documents.	It can be seen that there are fewer physical queues, the printing process is completed within ± 15 minutes.	Effective electronic systems speed up service times and reduce administrative burdens.
Continuity	Several informants stated that the system sometimes experienced problems (server down), and not all areas had stable internet access, the system was not well integrated in the application, there was a lack of socialization.	Within 2 days of observation, there was 1 system disruption which caused manual queuing to occur again.	Implementation is not yet fully sustainable because it relies on digital infrastructure.
Data Security	Officials said population data was stored on the Ministry of Home Affairs' central server, but they did not have full authority over data backup or encryption.	No written SOP was found regarding procedures for protecting users' personal data in the service area.	Data security is still a concern, especially in protection and management transparency.

Source: Processed data (2024)

Based on the findings of this study, the electronic system demonstrates relatively strong effectiveness in accelerating the public service process. However, its sustainability remains challenged by several technical issues, including frequent network disruptions. This research assesses the accountability of electronic-based public services by referring to Presidential Decree of the Republic of Indonesia Number 95 of 2018. The decree outlines the goal of achieving a clean, effective, transparent, and accountable government, along with the provision of high-quality and reliable public services. It emphasizes the necessity of implementing an electronic-based governance system, guided by the principles stated in Chapter 2: effectiveness, sustainability, and data security.

Accountability in this context is understood as extending beyond mere compliance with laws and regulations. It also encompasses the prudent, efficient, effective, and economical use of public resources (Soeharso, 2017). These principles serve as key indicators in evaluating the accountability of services provided by the population and civil registration office of Makassar City.

Effectiveness

This study examines the challenges in service delivery at the population and civil registration office of Makassar City, specifically in relation to the implementation of Presidential Regulation Number 95 of 2018. Although the regulation has been formally adopted, there are still several obstacles in achieving service delivery that aligns with the principle of effectiveness. The regulation states that effectiveness, as defined in Article 1, point (a), refers to efforts to optimize the benefits of available resources in supporting a successful and responsive electronic-based government system, tailored to public needs.

Despite the implementation of this regulation, field observations indicate that public services still do not fully meet the expectations of the community. Consequently, the optimization of services through the electronic-based application system at the population and civil registration office has not yet been fully realized. This aligns with the view of Aris et al. (2021), who state that the efficiency of public services can be evaluated through the extent to which objectives have been achieved in accordance with pre-established plans. Similarly, Anggraeni (2022) argues that effectiveness can be measured by comparing planned targets with the actual results achieved; if outcomes do not align with the intended goals, the results cannot be considered effective.

A key issue in establishing accountable electronic-based public services in Makassar lies in the education level of the community. Many residents remain unfamiliar with how to access services through the existing applications. Field data shows that routine administrative tasks, such as managing population movement or death certificates, often become complicated due to the lack of understanding of administrative procedures. In addition, many citizens struggle with using digital tools, such as Gmail, which is required for accessing services. These findings highlight the urgent need for clearer communication and outreach from local government institutions, particularly at the ward and sub-district levels, to ensure the public understands how to use electronic services effectively.

Another critical challenge is the integration of population data through the SIAK application, which is intended to manage records such as births, deaths, data changes, and marital status. Current field data reveals that the integration of this information is still lacking. This is primarily due to ineffective coordination between employees of the population and civil registration office and officials at the sub-district and village levels. As a result, most community data is not properly recorded in the SIAK system.

To enhance the accountability of electronic-based services, it is essential for the the population and civil registration office to improve coordination with lower-level administrative units and promote the adoption and use of the SIAK application. The indicators of education, system functionality, and human resources factors are summarized in Table 2.

Table 2. Synthesis of Research Results

Indicator	Interview Findings	Observation Results	Interpretation
User Education Level	Some service users with low educational backgrounds have difficulty operating service applications.	It was found that several residents asked officers for help because they did not understand how to input data.	The level of education influences the effectiveness of using electronic services.
Internal Server and Network Problems	Employees said there were frequent central server disruptions or slow connections during peak hours.	Queues occur due to the system being unresponsive at certain times.	Technical problems have a direct impact on the smooth running of electronic services.
Quality of Human Resources (HR)	Some employees do not have special technical training to handle digital system problems.	It can be seen that several employees rely on technical staff or operators when errors occur.	Service effectiveness is influenced by the readiness and competence of implementing human resources.

Source: processed data, 2024

Based on the research findings, it can be concluded that a low level of digital literacy significantly impacts the effectiveness of electronic-based public services. Even a well-designed system will not function optimally if users face difficulties in accessing it. A particularly pressing issue is the low level of digital literacy among local government officials, which hampers their ability to adapt to technological developments (Salam et al., 2024). Interview and observational data indicate that the digitalization of services such as the online issuance of population documents, the use of the integrated SIAK application, and various supporting applications has contributed to improved service effectiveness. These innovations have allowed the public to access services remotely, reducing the need to visit service offices and shortening service completion times.

Digitalization plays a crucial role in increasing the efficiency of public service delivery by streamlining administrative processes and minimizing physical queues. However, the benefits of digital services are not experienced equally by all segments of society. Elderly individuals and those with lower levels of education often face challenges in understanding digital procedures, highlighting the importance of providing targeted education and training to improve digital skills (Hendri, 2023). This indicates that the effectiveness of digital public services has not been socially equitable, thus necessitating a more inclusive approach.

When effectively implemented, digital governance can foster innovation, promote orderly and transparent administrative practices, and contribute to a culture of good governance in public institutions (Frinaldi et al., 2023). Therefore, attention must be paid to both the educational aspect and the design of user-friendly interfaces, which are key to enhancing accountability through service effectiveness. Technical issues also directly affect service reliability. In terms of accountability, frequent technical failures reflect poor system dependability, which can erode public trust. To mitigate this, local governments must decentralize information system management and invest in improving local capacity for managing digital infrastructure, including networks and backup servers.

Human resources remain a pivotal factor in ensuring the effectiveness of electronic public services. A lack of technical competence among staff can result in the suboptimal operation of digital systems. Consequently, continuous training and professional development for public employees are critical strategic measures to improve accountability and service quality. This research underscores the relevance of the digital equity theory, which stresses the importance of tailoring digital policies to the diverse social and demographic contexts of citizens (Van Dijk, 2006). As such, the aim of digital governance and public service accountability should be to reduce disparities in access and usage.

Finally, the successful implementation of policy programs requires adequate resources, including skilled human capital, sufficient budgeting, and reliable infrastructure (Tata et al., 2023). Public service accountability can be evaluated through several criteria, including service accuracy, professionalism of personnel, completeness of facilities, clarity of rules and regulations, and staff discipline (Nuriani et al., 2021). Accordingly, it is necessary to enhance employee understanding by providing opportunities for capacity development, particularly in the use of technology such as the SIAK application. Mastery of such tools can serve as a benchmark for accountable and effective digital service implementation.

Sustainability (Stability and Dependability of the System)

Continuity refers to the condition or characteristic of a system, process, or activity that enables it to maintain or extend its existence over time. It encompasses the capacity to endure, evolve, and adapt in response to changes in the external environment. More broadly, continuity is often associated with the principle of sustainable development, which emphasizes the need to balance economic, social, and environmental dimensions. In this context, continuity implies the implementation of actions or activities that not only address present needs but also preserve the potential of future generations to meet their own needs. Prioritizing continuity in decision-making at the individual, organizational, and governmental levels contributes to the creation of a stable, equitable, and sustainable world (Choirunnisa et al., 2023).

Specifically, the population and civil registration services in Makassar City continuity in electronic-based accountability involves several key aspects that ensure services can be delivered effectively and efficiently over time. These aspects include availability and accessibility, both of which are essential to ensuring that electronic service systems are easily accessible to all segments of the population, including those who are proficient in using information technology. This may involve ensuring affordable internet access and providing assistance services to those who need help navigating digital platforms. However, current conditions indicate that many members of the public still do not understand how to access the applications used by the population and civil registration office, resulting in a lack of consistent service delivery across both manual and digital platforms.

Operational continuity is another critical dimension. Electronic systems used in public service delivery must be designed to anticipate potential technical disruptions or failures. This requires comprehensive planning, including routine maintenance, disaster recovery mechanisms, and overall system security. Field observations reveal that technical issues such as the unavailability of population identification numbers, insufficient service operators, poor internet access, and unsynchronized data frequently disrupt the continuity of electronic service delivery.

Additionally, the sustainability of these systems depends on consistent maintenance and updates to ensure continued relevance and effectiveness. Systems must be updated in line with technological developments and user needs, which includes adding new features, fixing bugs, and improving data security. As such, electronically stored population data must be properly managed and protected to ensure its availability and accessibility when needed, enabling continuous service delivery.

Human resources also play a crucial role in maintaining operational continuity. Trained personnel are essential for managing and operating electronic systems effectively. Therefore, ongoing training and human resource development must be prioritized to ensure staff can operate these systems competently and respond to emergencies when necessary. Based on these considerations, the research findings on service sustainability can be structured using indicators that serve as a reference, as shown in Table 3 outlining sustainability indicators in electronic-based public service accountability.

Table 3. Synthesis of Research Results

Indicator	Description of Findings	Analysis Results
Availability and Affordability	Electronic systems are available but not yet fully accessible to people in areas with low internet connectivity.	Limited access to technology and the internet causes gaps in digital-based public services.
Operational Continuity	Online services are sometimes disrupted due to server downtime and dependence on central systems	Unstable services reduce public trust in the accountability of electronic systems.
Maintenance and Updates	There is no clear system maintenance schedule and system updates are often carried out without outreach	Lack of structured coaching and maintenance can reduce service performance and sustainability.

Source: Processed data (2024)

The results of the research indicate that the continuity of electronic public services is currently facilitated through official platforms such as the SIAK system and various supporting applications. However, interviews and field observations reveal that these services have not yet fully reached communities in peripheral regions or areas with limited internet connectivity. Many residents face significant challenges in accessing these digital services due to inadequate devices and unstable network infrastructure. Additionally, frequent operational disruptions occur, often caused by instability in the central server, which cannot be directly managed by local governments. These disruptions lead to longer service queues and extended processing times. Public willingness to use online services is closely tied to whether these services align with their communication habits and social interaction patterns (McNutt, 2014).

This study further highlights that the sustainability of electronic public services remains fragile, largely because the population and civil registration office still depends on a centralized national system beyond the full control of local authorities. According to Munir et al., (2023), frequent changes in information and communication technology (ICT) policies result in regulatory instability, which can adversely affect ICT infrastructure and, consequently, equitable access to services across Indonesia. Ensuring efficiency in public service delivery requires an emphasis on social justice so that all citizens have equal access to quality services (Rustiawan & Ike, 2024).

Aligned to this result, Aminah & Saksono (2021) identifies several persistent challenges in implementing e-government in Indonesia, including weak leadership, limited human resources, digital inequality, lack of coordination, and insufficient regulatory frameworks. These issues reinforce the conclusion that poor coordination between central and local institutions contributes to the suboptimal performance of public digital services, particularly in an environment where policies frequently shift. At present, the population and civil registration office lacks a structured mechanism for maintaining and updating its systems. Updates are often implemented abruptly without prior notice or adequate retraining for employees, disrupting the continuity of service delivery.

Therefore, the advancement of e-government still requires improvement, particularly in terms of service quality, efficiency, reliability, public trust, and community

engagement (Puji et al., 2021). The adoption of digital technologies by government employees defined as their willingness and ability to utilize modern tools in administrative functions is critical in this context. These findings underscore the importance of contingency planning, capacity-building for local technical human resources, and close collaboration between local and central governments to ensure the long-term continuity and effectiveness of digital public services.

Security Data (Protection and Privacy of Population Information)

Data security refers to the practices, policies, and technologies designed to protect information from misuse, alteration, or unauthorized disclosure. It encompasses all measures taken to ensure the confidentiality, integrity, and availability of data. In the context of electronic-based public service accountability at the population and civil registration office of Makassar City, data security is crucial for safeguarding sensitive population information that is stored and managed within the system. This importance is reflected in the implementation of electronic applications, where data protection is achieved through encryption processes. Personal data such as identity numbers, addresses, and other sensitive information must be encrypted to prevent unauthorized access.

Effective data security requires stringent access control measures to ensure that only authorized users can access and manipulate the data. This can be achieved through robust authentication systems, role-based authorization, and access limitations based on operational needs. In addition, continuous system monitoring and auditing are essential for detecting suspicious activities or potential security threats. Such monitoring allows for the early identification of security incidents and timely implementation of appropriate corrective actions. To support this, skilled personnel capable of conducting audits are needed in the event of a security breach.

Equally important is the provision of training and awareness programs for officers at the population and civil registration office. These initiatives aim to enhance their understanding of best practices in data security and improve their ability to recognize and respond to potential threats. For these reasons, the findings of this research are summarized in Table 4, which presents the data security indicators relevant to electronic-based public services at the population and civil registration office.

Table 4. Synthesis of Research Results

Indicator	Description of Findings	Analysis Results
Data Protection	The system is equipped with basic authentication and encryption features, but does not yet have a comprehensive personal data protection policy.	Without strong regulations, population data is vulnerable to misuse or access without permission.
Monitoring and Audit	There is no regular security audit and monitoring system for the electronic systems used.	The absence of regular audits means that potential security breaches cannot be detected and dealt with quickly.
Security Training and Awareness	Employees have not received regular training regarding data protection and electronic system security practices.	Low cybersecurity awareness and literacy among employees increases the risk of negligence and leaks.

Source: Processed data (2024)

Research indicates that the digital system at the population and civil registration office has adopted several data security measures, including the use of personal user accounts, encryption of information, and restricted access to sensitive data for authorized personnel. However, many informants admitted to not fully understanding the existing data security protocols. Additionally, public outreach related to privacy protection remains very limited. This situation poses a significant risk of data breaches, particularly in the absence of robust data management policies and consistent training for system operators.

The main concerns are ensuring the security and privacy of citizens' sensitive data. To address this, the implementation of reliable encryption systems and comprehensive security protocols is essential. Moreover, the government has a legal obligation to comply with prevailing regulations aimed at safeguarding individual privacy rights (Prihatmanto et al., 2024). Makassar City is currently grappling with serious cybersecurity challenges due to its increasing reliance on digital systems in public administration (Salam et al., 2024). Thus, there must be a strong governmental commitment to protecting data and information, which are critical public assets. Investments in information technology infrastructure are also vital to ensuring comprehensive data protection (Munir et al., 2023).

Currently, the protection of population data in Makassar is still suboptimal. A dedicated security monitoring system and routine audits of digital activity and system integrity have yet to be implemented. Furthermore, most employees have not received specialized training in data security and digital information protection. These gaps highlight the importance of data security as a core component of public service accountability. Without sufficient protection systems, audit mechanisms, and capacity building for human resources, the risk of data leaks and misuse remains high.

Therefore, more serious policy interventions and technical safeguards are necessary to ensure safe and accountable system operations. Data security practices must also align with applicable laws, such as personal data protection regulations and international standards like ISO, to ensure that the population and civil registration office complies with data governance rules. Strengthening these measures will improve protection of sensitive population data and help maintain the safety, reliability, and trustworthiness of electronic public services. This, in turn, will foster greater public trust in the use of technology in government service delivery.

Based on a theoretical perspective, these findings underscore the importance of applying the principles of data governance and digital accountability. Data management is not merely a technical task, but also involves ethical responsibility and the protection of citizens' privacy rights.

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