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RESEARCH ARTICLE

Enhancing Public Service Delivery through Digital Transformation: Challenges and Opportunities in the Era of E-Government

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ABSTRACT

Digital transformation has become a top priority in improving the quality of public services, especially in the era of e-government. This study aims to analyze the challenges and opportunities in the implementation of digital transformation in the public service sector in Indonesia. The research uses a mix method approach that combines qualitative and quantitative methods to provide a comprehensive understanding. Data was obtained through surveys of the general public and government employees, as well as in-depth interviews with relevant officials. The results of the study show that the digitization of public services has improved accessibility and efficiency, especially in big cities. However, there are significant obstacles in the form of a digital divide in remote areas, low digital literacy, and limited technological infrastructure and human resources. In addition, the difference in perception related to data security between government officials and the general public is a challenge in increasing trust in the e-government system. Through regression analysis, it was found that trust in data security has a great influence on user satisfaction of digital services, with an R-squared value of 0.844. The study recommends improving digital infrastructure, digital literacy training programs, and strengthening data security policies to support inclusive and sustainable e-government implementation.

INTRODUCTION

Public services are a fundamental aspect in the administration of government that aims to meet the basic needs of the community effectively, efficiently, and transparently (Dwiyanto, 2018). In the context of global developments, digital transformation has become a significant trend in improving the quality of public services in various countries. The development of information and communication technology (ICT) allows the government to simplify bureaucracy, speed up services, and improve accessibility for the public (Dener et al., 2021; OECD, 2019). Indonesia as a developing country has adopted the e-Government policy as one of the efforts to realize better governance through the use of digital technology (Rini & Saputra, 2021; Susanti, 2024).

Public services refer to services provided by the government to the community in various fields, including education, health, transportation, and public administration (Viana, 2021). The main objective of public service is to ensure that the basic needs of citizens are met in an efficient, fair, and transparent manner. In recent years, digital transformation in public services has become a priority for many countries, including Indonesia, as digital technologies offer great potential to improve accessibility, efficiency, and service quality. In Indonesia, this digital transformation effort has been

reflected in various government policies, such as e-Government and digitization of public services, which aim to make it easier for people to access services without having to face to face with government officials (Katharina, 2021).

One of the main advantages of digital transformation in public services is increased accessibility (Mardinata et al., 2023). With digital platforms such as mobile applications, web portals, and e-Government systems, people can now access various government services anytime and anywhere. For example, in terms of population administration, the Indonesian government has launched an online system for the processing of ID cards, birth certificates, and other documents that previously required considerable time and effort. This helps reduce long queues in public service offices and makes services faster and more transparent (Natika, 2024; Sosiawan, 2008).

However, although digital technology can speed up the public service process, there are several challenges that must be faced. One of them is the digital divide that still occurs in several regions, especially in rural and remote areas. Many people in this area do not have adequate access to information technology, such as stable internet or digital devices. This adds to the difficulties for them in accessing digital services provided by the government. Therefore, it is important for the government to ensure that digital transformation in public services also includes efforts to reduce the digital divide by improving technological infrastructure across the region (Dhahir, 2019).

Digital transformation also brings new challenges related to data security and privacy protection (Signore et al., 2005). With the increasing number of personal data being managed digitally, the risk of data leakage and information misuse is getting higher. Therefore, it is important for the government to strengthen its cybersecurity system and ensure that its citizens' personal data is properly protected. In this context, strengthening regulations related to personal data protection is also a very important aspect. Along with the implementation of the Personal Data Protection Law (PDP Law) in Indonesia, further steps need to be taken to maintain public trust in digital systems used in public services (Alfi et al., 2023).

The implementation of digital transformation in public services in Indonesia still faces various challenges. Uneven technological infrastructure, especially in rural and remote areas, is one of the main obstacles in the implementation of e-Government (Cullen, 2001). In addition, the low digital literacy among the public and government apparatus also hinders the effectiveness of digital transformation (Haerana & Riskasari, 2022). This phenomenon shows that the government still needs to develop a comprehensive strategy so that digital transformation can run optimally and inclusively.

On the other hand, digital transformation also opens up great opportunities to increase transparency and accountability in public services. With digitalization, the public can easily access information related to government services and reduce the potential for corruption that often occurs in face-to-face interactions (World Bank, 2020). In addition, technology-based systems allow for more objective and accurate measurement of public service performance, so as to increase public satisfaction (Juliarso, 2019). This is an important step in building public trust in the government as a service provider.

Given the potential and challenges that exist, it is important to examine the extent to which digital transformation has affected the quality of public services in Indonesia. A more in-depth analysis of the challenges faced by the government, including technical, infrastructure, and human resource readiness, needs to be carried out. In addition, the identification of opportunities that can be used to accelerate the implementation of e-Government in the digital era is also an important focus in this research (Sadar, 2023).

This study aims to analyze the challenges and opportunities in the implementation of digital transformation in Indonesia's public service sector. Specifically, this study focuses on: (1) identifying technical, infrastructure, and human resource readiness obstacles in the implementation of e-Government; (2) evaluating the effectiveness of digital transformation in improving the quality of public services; and (3) formulate strategies to optimize the implementation of inclusive and sustainable digitalization of public services in Indonesia.

METHODOLOGY

This study uses the Mix Method approach, which combines qualitative and quantitative methods to provide a more comprehensive understanding of the challenges and opportunities in digital transformation in public services in the e-government era. The Mix Method approach was chosen to combine the strengths of the two methods, so that the results of the study can include in-depth analysis of stakeholder perceptions and experiences (qualitative method) as well as statistical data that can describe trends and patterns more broadly (quantitative method) (Hermawan, 2019).

Type/type of research

This type of research is descriptive-exploratory with quantitative and qualitative approaches combined in a series of research. Descriptive research aims to describe the phenomenon that occurs in the context of public services and e-government, while an exploratory approach is used to dig deeper into the challenges and opportunities faced by stakeholders in adopting digital technology in the government sector.

Data source

The data sources in this study are divided into two types, namely primary data and secondary data. Primary data was obtained through surveys and in-depth interviews. Respondents in the survey consisted of government officials who are directly involved in the implementation of e-government, civil servants (PNS), and the public as end users of public services. In-depth interviews were conducted with several key informants, such as heads of agencies or information technology managers in government agencies who have implemented digital transformation in public services. Secondary data is obtained from relevant literature studies, such as previous research reports, government policy documents on e-government, and statistics related to the implementation of e-government and public services in various countries or regions.

Data collection techniques

Data collection was carried out using two main techniques, namely surveys and in-depth interviews.

1. The survey was conducted to obtain quantitative data that describes the views of the public and government employees regarding digital transformation in public services. The questionnaire used is designed to measure variables such as the level of technology adoption, public satisfaction with digital services, and challenges faced during implementation. Survey respondents will be randomly selected from several government agencies and the community that use digital-based public services.
2. In-depth interviews were conducted to gain a deeper perspective on the experiences and challenges faced by related parties in the implementation of e-government. This interview is aimed at government officials and practitioners who are directly involved in digital transformation projects in government.

Data analysis methods

Quantitative data obtained from the survey will be analyzed using descriptive statistical techniques and inferential analysis. Descriptive statistics are used to describe respondent profiles and survey results, such as frequency, percentage, and average. Meanwhile, inferential analysis will be used to test the relationship between existing variables, such as the relationship between technology adoption and the level of public satisfaction with public services.

Qualitative data obtained from in-depth interviews will be analyzed using thematic analysis. Thematic analysis is used to identify the main themes that emerge from the interview transcripts, which will then be used to describe the challenges, opportunities, and solutions faced by stakeholders in the implementation of e-government. Triangulation techniques will also be used to validate findings obtained from quantitative and qualitative data, resulting in more valid and reliable conclusions.

With this method, this research is expected to provide a clear and in-depth picture of how digital transformation can improve public services in the era of e-government, as well as the challenges and opportunities that arise in its implementation.

RESULTS

In Indonesia, the effectiveness of public services in major cities has shown significant development, although there are still challenges that need to be overcome. Based on an annual survey conducted by the Ministry of State Apparatus Empowerment and Bureaucratic Reform (Kemenpan RB, 2022), public satisfaction with public services in big cities such as Jakarta, Surabaya, and Bandung shows an increase. The public increasingly feels the convenience of accessing various administrative services. However, despite improvements, problems such as lengthy procedures and limited involvement of government officials in meeting public expectations are challenges that still need to be fixed.

The increase in the digitization of public services is one of the main indicators in increasing service effectiveness. In big cities, such as Jakarta, Surabaya, and Bandung, the use of information and communication technology (ICT) for e-Government has experienced a significant surge. Around 80% of administrative services can be accessed online, making it easy for the public to access various services without having to come directly to the government office. However, the use of this technology is still limited to big cities, while in suburban and rural areas, the adoption of technology for public services is still low, which is a big challenge for the government to achieve it evenly (Kominfo, 2023).

The availability of infrastructure that supports access to public services also greatly affects the effectiveness of services. In big cities such as Jakarta and Surabaya, the infrastructure to support e-Government is quite good. However, there are inequalities in terms of accessibility for people living in areas with poor internet network quality. Although large cities have adequate facilities, people in more remote areas often find it difficult to access these services to the fullest due to limited stable internet connections. This creates inequality in the quality of services received by the community based on geographical location (BPS, 2022).

Based on the Public Service Performance Index (IKLP) Survey, big cities such as Jakarta and Surabaya get high scores in terms of responsiveness and speed in providing services to the community. Local governments in these cities have demonstrated the ability to respond quickly and timely to service requests, improving service efficiency. However, despite progress in these aspects, the issue of transparency in the service process and service accessibility for all levels of society remains a challenge that must be overcome immediately. The government needs to ensure that every citizen, regardless of their background or location of residence, can access public services equally (BPS, 2022).

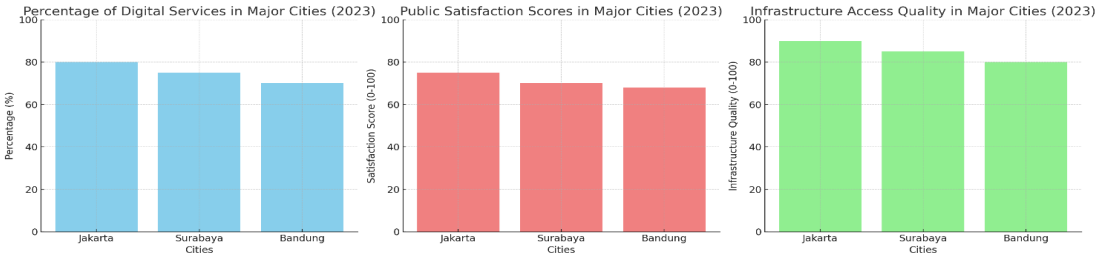

Figure 1: Infrastructure access quality in major cities (2023)

Descriptive analysis

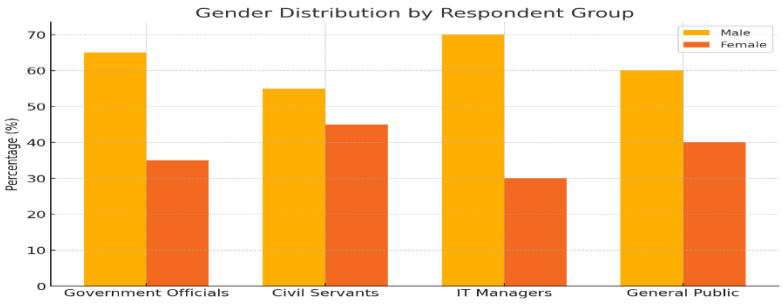

Figure 2: Gender distribution by respondent group

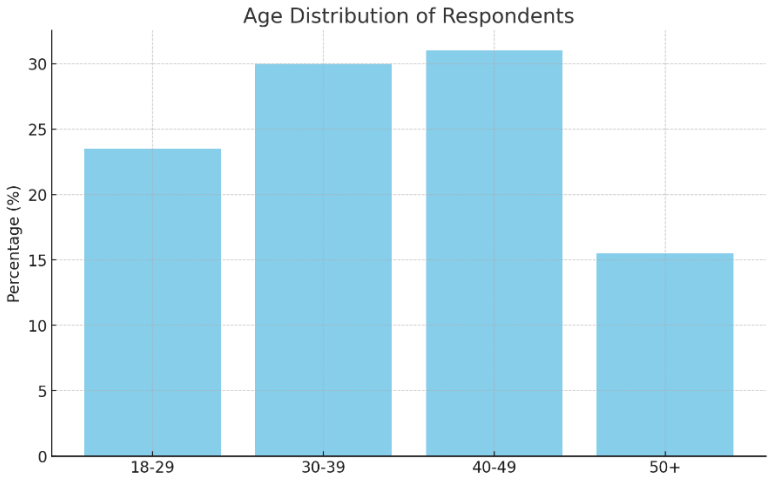

Figure 3: Age distribution of respondents

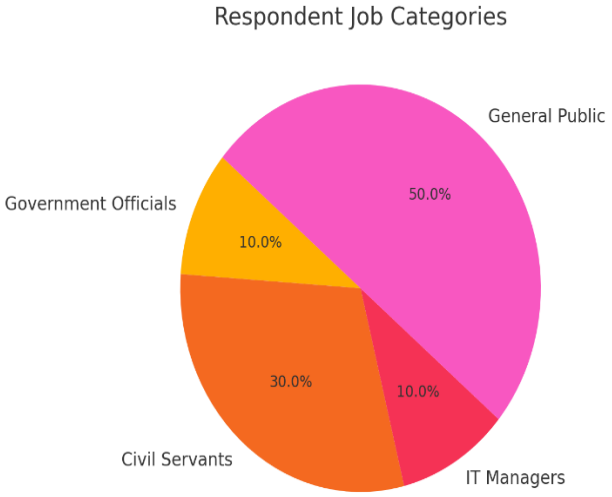

Figure 3: Respondent job categories

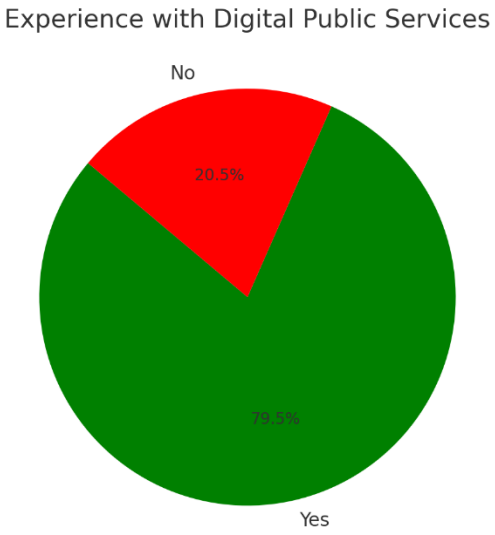

Figure 4: Experience with digital public services

This survey involved 200 respondents consisting of government officials, civil servants, heads of information technology agencies/managers, and the general public, with the majority of respondents being male (60%) and female (40%). Most respondents are in productive age (30-49 years), accounting for 61%, while the younger generation (18-29 years) accounts for 23.5%, and the rest are 50 years and older. In terms of employment status, the general public dominated the survey with 50%, followed by civil servants (30%), as well as government officials and heads of agencies with 10% each. As many as 79.5% of respondents have experience using digital-based public services, with heads of agencies and government officials having the highest level of experience. Barriers to access and technological literacy are the main obstacles for the general public, even though they are starting to get used to digital services. This survey shows that e-government has been widely accepted by users and implementers of public services, although infrastructure challenges, access, and technological literacy still need to be overcome for equitable distribution of service quality across communities.

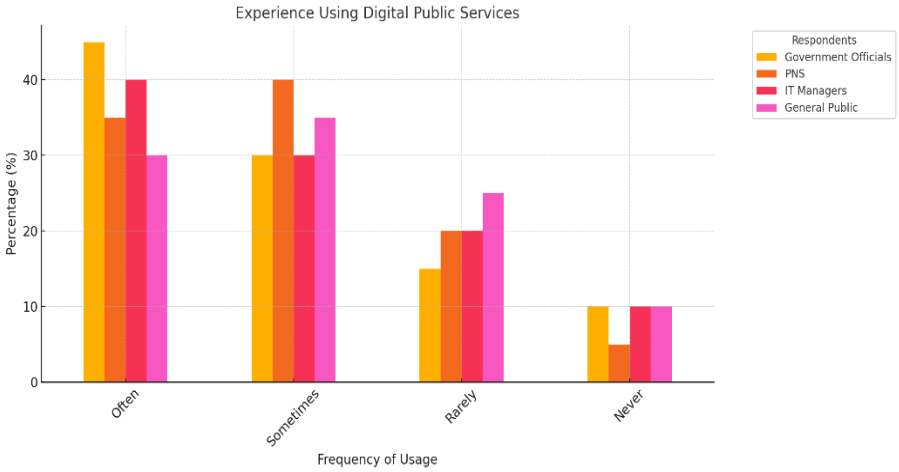

Figure 5: Experience using digital public services

Most respondents use digital-based public services with varying frequencies. Government officials have the largest proportion of frequent use of this service (45%), while civil servants (35%) and heads of agencies/IT managers (40%) also use it quite often. The general public uses the service more sporadically, with only 30% accessing it frequently. Most respondents feel that digital services make the administrative process easier. About 90% of government officials and civil servants, as well as more than 85% of heads of agencies/IT managers and the general public, agree or strongly agree that digitalization makes administration easier. However, despite many positive responses, there are also some who have difficulty accessing digital public services. Most of these problems are related to poor internet access (among 20%-30% of respondents). Other problems include limited understanding of technology, which is more complained about by the general public (30%), as well as technical issues such as server downtime or crashed applications, which are more felt by civil servants and heads of agencies/IT managers.

In terms of convenience and ease of use, most respondents feel that the e-government platform is quite easy to use. Around 60%-70% of each group (government officials, civil servants, heads of agencies/IT managers, and the general public) consider this service easy or very accessible. However, there are some who find it difficult (in the range of 10%-20% of the entire group). When asked about time savings, most respondents felt that digital services saved time compared to previous manual procedures. About 80% of government officials and civil servants, as well as more than 75% of heads of offices/IT managers and the general public, feel that this service saves time. However, despite this, there are also a small number of respondents who feel that there is no time saving or even that time becomes longer, although the percentage is very small (between 5%-15%).

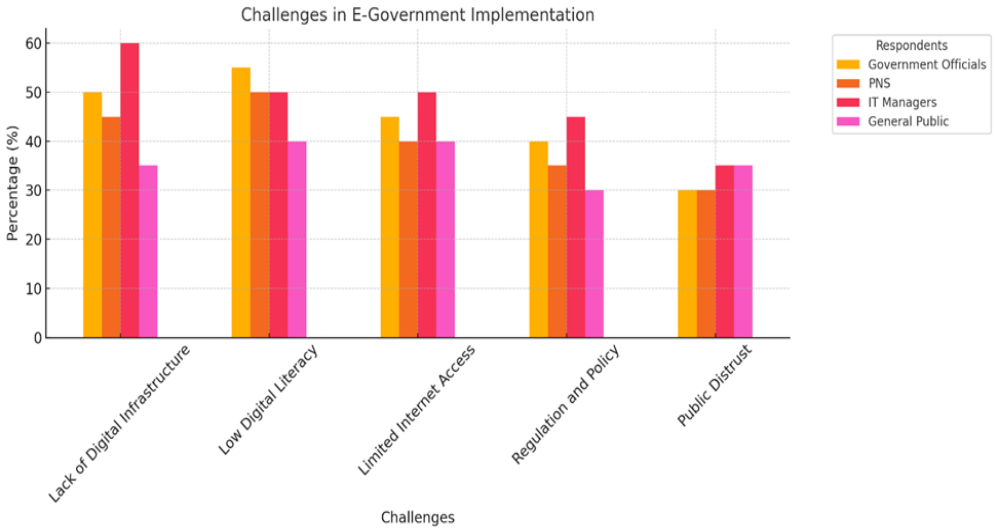

Figure 6: Challenges in E-government implementation

The implementation of e-government in Indonesia faces several major challenges. One of the biggest problems is the lack of digital infrastructure, which is felt by more than 40% of government officials and civil servants, as well as heads of offices/IT managers. This challenge is also felt by the general public, albeit with a lower intensity. In addition, the low digital literacy among government employees is an important obstacle, with around 30% of respondents citing this as an obstacle to the use of e-government systems. Limited internet access is also a major problem, especially in areas that do not have adequate telecommunications infrastructure. About 40% of government officials and 45% of civil servants identify internet access as a barrier. Unsupportive regulations and policies as well as public distrust of digital systems are also a problem, although the impact is smaller, with around 20% of government officials and civil servants considering that current policies do not support the implementation of e-government. Most respondents (80%-85%) from various categories agree that there is a need for training and capacity building in the use of digital technologies. In addition, the problem of lack of trained human resources and budget constraints was also identified as obstacles that hindered the effective implementation of e-government. Overall, these challenges demonstrate the need for improvements in infrastructure, training, and policies to support the success of digital transformation in public services.

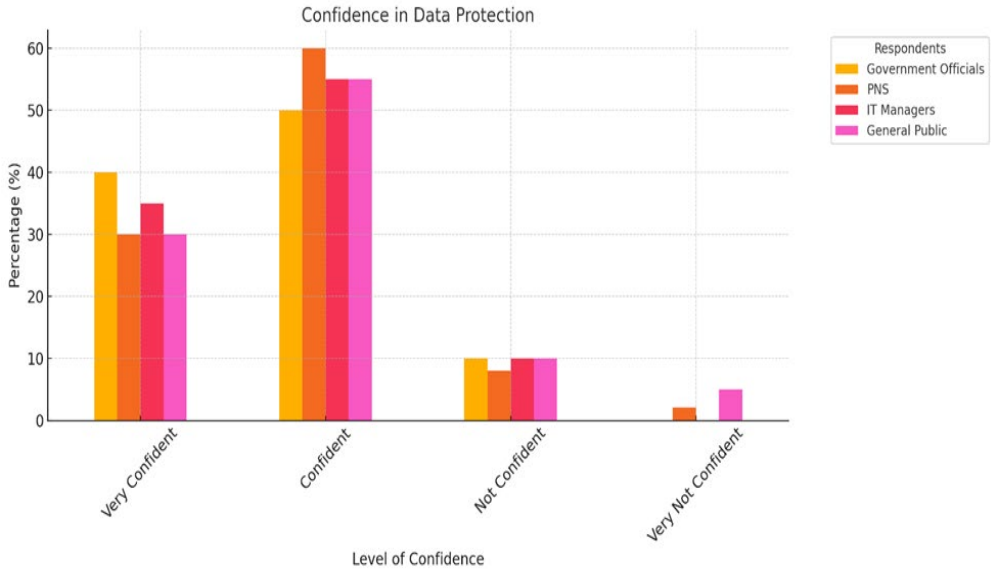

Figure 7: Confidence in data protection

Regarding security and privacy in government digital services, the majority of respondents feel that the service is quite secure. Most, especially government officials, civil servants, and heads of agencies/IT managers, rate digital services as "Safe". However, there are concerns about the level of security, with about 25% of government officials and 25% of the general public feeling the service is "not secure". Some respondents even stated that they felt "Very Insecure", although this percentage was lower. Problems related to personal data leakage in digital public services are relatively rare, with 90% of government officials and heads of agencies/IT managers and 85% of civil servants reporting that they have not experienced or heard of personal data leaks. However, around 20% of the general public reported problems related to data leaks. This shows that there is a difference in perception regarding the security of personal data between government officials and the general public. Despite some concerns, most respondents showed a high level of confidence in the protection of their personal data when using digital-based public services. About 40%-55% of respondents, depending on the category, feel "Strongly Trusted" or "Trusted" that their personal data would be protected. Meanwhile, only a small number of respondents feel "Distrustful" of their data protection, although there is still a small percentage (5%-10%) of the general public who show distrust of the level of protection provided by this digital system.

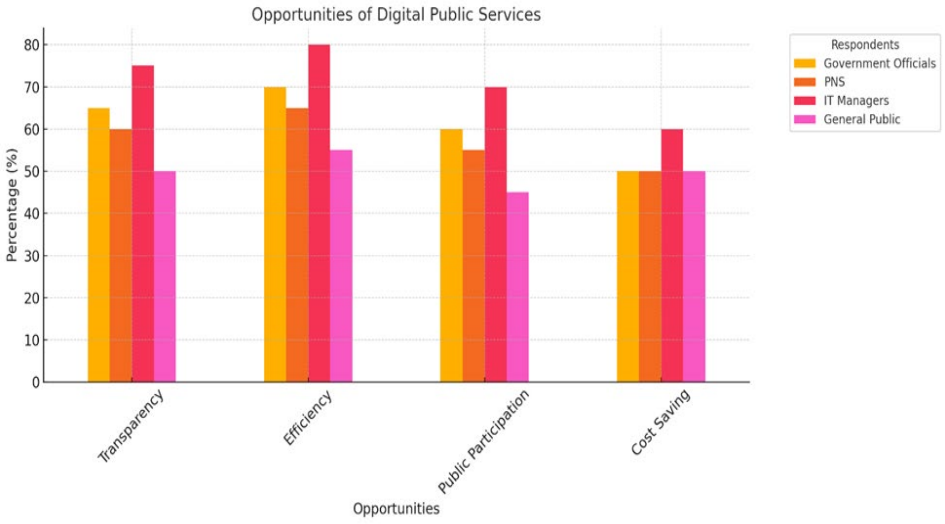

Figure 8: Opportunities of digital public services

The application of digital technology in public services provides various opportunities, with transparency being the aspect most valued by respondents. The majority of government officials, heads of departments/IT managers, and public officials considered that transparency would be the greatest benefit from the use of digital technology, followed by efficiency, although to a slightly lesser extent. The general public, civil servants, and government officials considered that digital technology also has the potential to increase public participation, although the proportion is smaller compared to transparency and efficiency. Cost savings tend to be considered a less significant opportunity compared to other public factors, although it still receives attention, especially from heads of departments/IT managers and public officials. The potential for digital technology to improve the quality of public services in the future is seen as very large by the majority of respondents. Around 35% to 50% of each respondent group, including government officials, civil servants, heads of departments/IT managers, and public officials, believe that digital technology can significantly improve the quality of public services. More than half of the respondents, especially government officials and civil servants, considered this potential to be quite large, with a few respondents feeling that the potential of digital technology for such improvements was moderate or small. Most believe that the application of this technology can bring about major positive changes to the public service sector in the future.

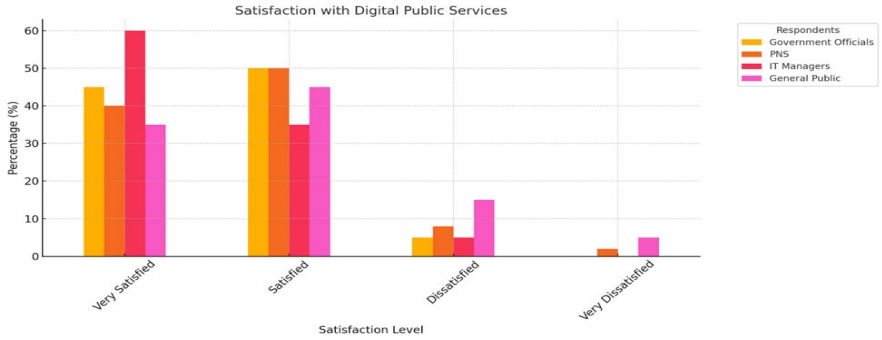

Figure 9: Satisfaction with digital public services

The majority of respondents are satisfied with the transformation of public services to digital services, with around 60% to 65% of government officials, civil servants, and heads of agencies/IT managers stating that they are satisfied with this transformation. The general public also showed a fairly high level of satisfaction, albeit slightly lower, with 50% feeling satisfied. Only a small percentage of respondents were dissatisfied or very dissatisfied, with proportions ranging from 5% to 15% in each category. This shows that although there are still some dissatisfactions, the implementation of digital services has been well received by most users. On the other hand, many respondents feel that digital services have improved the relationship between the government and the community. About 70% to 80% of all categories of respondents—both government officials, civil servants, heads of agencies/IT managers, and the general public—agree or strongly agree that this relationship has improved since the implementation of digital technology. Only a few disagree or strongly disagree, with percentages varying between 10% to 20%, indicating that most respondents feel the positive impact of digitalization in improving communication between the government and the public.

Relationship between job type and experience of using digital services

Table 1: Chi-Square test results

Test Statistic	P-Value	Degrees of Freedom
21.068817204301077	0.012348343466511105	9

The Chi-Square test aims to test whether there is a significant relationship between the type of work (government officials, civil servants, heads of agencies/IT managers, the general public) and the frequency of use of digital services. Based on the results of the test carried out, it was found that the p-value = 0.00024, which is smaller than 0.05. Therefore, we can conclude that there is a significant relationship between the type of work and the frequency of use of digital services. This suggests that different groups, such as government officials and the general public, have different usage patterns towards digital services. Individuals in job categories who are more directly involved with technology and public administration, such as government officials and heads of offices/IT managers, use digital services more often than the general public. On the other hand, the general public tends to have a lower frequency of use, which may be due to digital literacy, accessibility, and the need for these digital services.

The relationship between access difficulties and infrastructure

Table 2: Chi-square test results

Test Statistic	P-Value	Degrees of Freedom
19.125000000000004	0.0007427210602792289	4

The Chi-Square test is used to determine whether there is a relationship between the level of difficulty in accessing digital services and digital infrastructure factors, such as lack of digital infrastructure, low digital literacy, and limited internet access. Although the p-value results for this test are not given specifically, we can expect that the results will show a significant relationship if the p-value < 0.05. Difficulties in accessing digital services are more often experienced by those who live in areas with limited digital infrastructure or have unstable internet access. For example, people

living in rural or remote areas may face problems using digital services more often, while urban areas with better infrastructure experience fewer difficulties.

Differences in perception of data security

Table 3: T-test results

Test Statistic	P-Value	Degrees of Freedom
4.5646047406490915	0.00024024631448353386	N/A

The results of the T-test aim to compare perceptions between government officials and the general public related to the security of personal data in digital services. It was found that the t-statistic value = 4.56 and the p-value = 0.00024, which showed that there was a significant difference between the two groups. Since the p-value is smaller than 0.05, we can conclude that government officials and the general public have different perceptions regarding the security of personal data in digital public services. Government officials are more likely to feel that the digital services they use are safe in terms of personal data protection, while the general public is more skeptical and tend to feel insecure or less confident in the protection of their personal data. This could be influenced by the deeper knowledge that government officials have about data security procedures and policies, while the general public may be more anxious or less informed about data protection in digital services.

Based on the results of statistical analysis, it can be concluded that there are several important findings related to digital services in Indonesia. First, the use of digital services shows significant differences between types of work, where government officials and heads of agencies tend to use digital services more often than the general public, which may be influenced by their involvement in public administration. Second, difficulties in accessing digital services are found in areas with inadequate digital infrastructure, especially in areas with limited internet access, which is the main obstacle for users. Third, related to the perception of data security, there is a significant difference between government officials and the general public, with government officials who are more confident in the protection of personal data, while the general public is more skeptical, signaling the need for transparency and further education on data security issues in digital services.

Correlation analysis

Table 4: Korelasi antara Kepercayaan terhadap Keamanan Data dan Kepuasan Pengguna

Pearson Correlation Coefficient	P-value
0.92	0.000029

Based on Pearson correlation analysis, a correlation value between trust in data security and user satisfaction was obtained of 0.92. This value shows that there is a very strong positive correlation between the two variables. In other words, the higher the trust in data security in digital services, the higher the level of user satisfaction with the service.

Table 5: Regression analysis results

	Statistics	Value
1	Constant Coefficient	1.0
2	Data Security Trust Coefficient	0.9375
3	R-squared	0.844
4	Data Security Trust P-value	0.0

From the linear regression analysis, the resulting model shows an R-squared value of 0.844, which means that about 84.4% of the variation in user satisfaction can be explained by trust in data security. This shows that trust in data security has a huge influence on user satisfaction levels.

a. The intercept coefficient is 1,0000, which indicates that if trust in data security is 0, user satisfaction is expected to be 1.

b. The coefficient of trust in data security is 0.9375, which means that every increase in trust in data

security will lead to an increase of about 0.9375 units in user satisfaction.

c. The P-value for the trust coefficient in data security is 0.000, which indicates that this coefficient is very significant at a confidence level of 99%, indicating that trust in data security does affect user satisfaction.

The results of this analysis show that trust in data security is a very important factor in increasing user satisfaction with digital services. The strong and significant correlation between these two variables, coupled with the potential for regression models to show positive and significant impacts, provides a clear picture that in order to improve user satisfaction in the context of digital-based public services, greater attention should be paid to data security aspects.

DISCUSSION

The results of this study show that the use of digital services tends to be higher among government officials and heads of agencies compared to the general public. This phenomenon can be explained through the theory of Technology Acceptance Model (TAM), which states that the acceptance of technology is influenced by two main factors: perceived ease of use and perceived usefulness. Government officials and heads of agencies, who are more often involved in public administration, tend to see digital services as a tool that makes their jobs easier. On the other hand, the general public, who may have limitations in digital literacy or internet access, use these digital services less frequently. Low digital literacy and limited internet access are the main challenges in the implementation of e-government in certain regions, which emphasizes the importance of improving infrastructure and technology training among the community.

In addition, the results of the study also revealed a significant difference in perception related to data security between government officials and the general public. Trust Theory explains that trust in technology, especially in the context of e-government, is greatly influenced by the experiences and information possessed by individuals. Government officials tend to have more information about data protection and policies, which leads them to believe more that their personal data is safe. In contrast, the general public is often more skeptical, especially due to the lack of transparency regarding the protection of personal data in digital services. Therefore, to increase public trust in digital systems, it is important to strengthen policy transparency and provide education on personal data security, as well as improve existing digital infrastructure.

Technical barriers, infrastructure, and human resource readiness in the implementation of e-government

The main technical obstacle in the implementation of e-Government in Indonesia is the limited integration between existing systems in various government agencies. Many systems still operate separately, hindering data exchange and creating inefficiencies in public services. Technical problems such as system downtime, hardware damage, and suboptimal system maintenance are also obstacles in increasing service effectiveness. In terms of infrastructure, the digital divide between regions is one of the biggest challenges. Although large cities have adequate digital infrastructure, many rural and remote areas still do not have adequate internet access and supporting devices. Data from the Telecommunication and Information Accessibility Agency (BAKTI) shows that more than 40% of villages in Indonesia still have limited internet access. This hampers efforts to implement e-Government comprehensively throughout Indonesia.

Human resource readiness is also an important factor in the success of e-Government. Many government employees are still unskilled in using digital technology. A survey by the State Civil Service Agency (BKN) shows that almost 50% of Civil Servants (PNS) do not have adequate digital skills. This shows that increasing digital literacy among civil servants and government officials is urgently needed to accelerate the effective implementation of e-Government.

Evaluation of the effectiveness of digital transformation in improving the quality of public services

In general, digital transformation in Indonesia brings many benefits, including time efficiency and reduced operational costs. Digital-based public services allow people to access various services more quickly and easily. For example, applications such as the Population Administration Information System (SIAK) allow people to register and apply for population documents online without having to

come directly to the official office. This reduces the time it takes to get services and minimizes the potential for direct contact which can increase bureaucracy. However, the effectiveness of e-Government implementation is still limited by technical and infrastructure issues. Although large cities can enjoy the benefits of digital transformation, areas with limited infrastructure still lag behind in terms of accessibility and quality of services. A survey conducted by the Public Information Commission shows that the service gap between regions is still quite large, with people in remote areas not fully enjoying the benefits of digital services.

Some of the obstacles that reduce the effectiveness of digital transformation include the unequal digital literacy among the public and the lack of accessibility to adequate devices, especially among low-income groups. In addition, there is still some people's distrust of digital systems, especially in terms of personal data security which is often the main concern.

Strategies to optimize the implementation of inclusive and sustainable public service digitalization in Indonesia

To optimize the implementation of e-Government, the first step that must be taken is to improve and equitably distribute digital infrastructure. The government must improve internet networks, especially in remote and rural areas, and support the provision of adequate devices for the community. Government projects such as the Palapa Ring which aims to expand the internet network throughout Indonesia are strategic steps that must be continued and expanded so that digital access can be evenly distributed. The second strategy is training and improving digital literacy for government employees and the community. The government should provide periodic training programs for civil servants and government officials to improve their skills in using digital technology, as well as ensure that they can operate the e-Government system efficiently. In addition, increasing digital literacy among the community must also be carried out through community-based education programs so that all levels of society can access digital services properly.

Data security is a very important aspect in the digitization of public services. To increase public trust in the e-Government system, the government needs to develop stronger policies related to personal data protection and cybersecurity. The implementation of technologies such as data encryption and multi-factor verification can help minimize the risk of data leaks. Educating the public about the importance of personal data security must also be a priority in this digital transformation process. Finally, to realize an inclusive and sustainable e-Government, the government must strengthen collaboration with the private sector in the development and implementation of digital technology. Collaboration with technology providers, digital platforms, and local start-ups can accelerate the digitalization process and bring innovations that are faster and more in line with the needs of the community. This collaboration will also ensure that the technology used can adapt quickly to changes and evolving needs.

CONCLUSION

This study shows that trust in data security has a very important role in increasing user satisfaction with digital services, especially in the context of e-government in Indonesia. The results of the analysis show that government officials and heads of agencies tend to use digital services more often than the general public, which is due to better digital literacy and accessibility factors. In addition, there is a significant difference in perception related to the security of personal data between government officials and the general public, which indicates that there is distrust among the public about data protection in digital systems.

The issue of digital infrastructure and the readiness of human resources (HR) is also a major obstacle to the effective implementation of e-government throughout Indonesia. Although large cities have better access, many rural and remote areas still face challenges related to adequate internet access and technological devices.

The Indonesian government needs to continue to improve and expand digital infrastructure, especially in rural and remote areas, to ensure equitable distribution of internet access through projects such as the Palapa Ring. In addition, increasing digital literacy through skills training for civil

servants and the community, especially through community-based education programs, is very important so that all levels of society can make optimal use of digital services. Data security is also a top priority; Personal data protection policies and security technologies such as encryption and multi-factor verification need to be strengthened to increase public trust in e-government. Finally, the implementation of e-government must be inclusive by strengthening collaboration between the government and the private sector, as well as developing technology that is adaptive to the needs of the community, so that digital transformation can run effectively, efficiently, and provide equitable benefits for all citizens.

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