

# Governance in the Digital Era: Analyzing the Adoption of E-Government Services in Local Authorities Through Quantitative Methods

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## Abstract

The rapid digital transformation has significantly impacted public governance, particularly through the adoption of e-government systems. While numerous studies have highlighted the benefits of e-government at the national level, attention to its implementation at the local authority level remains limited. Local authorities face unique challenges, such as limited technological infrastructure, inadequate staff competencies, and varying levels of public trust. This study aims to identify the key factors influencing e-government adoption at the local level and evaluate its impact using a quantitative approach. Data were collected from 150 local authorities in urban and rural areas through structured surveys and analyzed using multiple linear regression. The study's results indicate that digital infrastructure has the strongest influence on e-government adoption, with a regression coefficient of  $\beta = 0.45$  ( $p = 0.001$ ). Staff competency ( $\beta = 0.35$ ,  $p = 0.015$ ) and public perception ( $\beta = 0.25$ ,  $p = 0.045$ ) also significantly contribute to adoption levels. Together, these three factors explain 65% of the variance in e-government adoption ( $R^2 = 0.65$ ). These results align with the Technology Acceptance Model (TAM), which identifies perceived ease of use and perceived usefulness as key determinants of technology acceptance. This study contributes to the existing literature by focusing on the context of local authorities and providing empirical evidence on how infrastructure, staff competencies, and public perceptions influence e-government adoption. The results underscore the importance of improving technological infrastructure, investing in staff training, and promoting digital literacy among the public to accelerate digital transformation at the local level.

**Keywords:** E-government Adoption, Local Authorities, Digital Infrastructure, TAM, Public Trust and Digital Literacy.

## I. INTRODUCTION

Digital transformation has become a global phenomenon with significant impacts on various aspects of life, including public governance. Digitalization is not merely intended to improve administrative efficiency but also introduces new ways for governments to interact with citizens. One prominent solution emerging in this era is the implementation of e-government. The primary goal of e-government is to enhance efficiency, transparency, and the quality of public services through the use of digital technology. This technology enables governments to streamline administrative processes, reduce bureaucracy, and deliver faster, more efficient, and responsive services. Many countries and regions have adopted e-government, particularly at the local authority level, which plays a critical role in delivering direct services to the public. However, the implementation of e-government is uneven across regions. Many areas face substantial

challenges, such as limited technological infrastructure, insufficient staff competencies, constrained budgets, and low levels of public trust in digital technology. These obstacles are key factors slowing the adoption of e-government in various contexts.

Previous studies have emphasized the importance of technological infrastructure as a critical element for the successful implementation of e-government, particularly at the national level. For instance, (Mohammadi, 2022) highlighted that the availability of widespread and reliable internet connectivity is a crucial factor influencing e-government adoption. However, research specifically addressing the local level remains relatively limited, despite the strategic role of local authorities in extending digital services to the public, particularly in areas with limited technological access. (Doran et al., 2023) found that factors such as leadership and community support significantly influence the success of e-government implementation at the local level, although these factors are not always relevant in national-level contexts. Similarly, (Chohan & Hu, 2022) stressed the necessity of staff training and competency development to ensure the sustainability of e-government implementation at the local level. Additionally, (Hooda et al., 2022) revealed that public trust in digital technology plays an essential role in influencing the acceptance and use of e-government services.

While e-government adoption has garnered considerable attention in numerous studies, the majority of research focuses on national or regional levels, with limited attention to the context of local authorities. For example, (Tan et al., 2020) emphasized the importance of technological infrastructure in supporting e-government adoption at the national level but did not explore how these challenges affect local-level implementation. (Elmatsani et al., 2024) underscored the role of leadership in enhancing the success of e-government adoption in major cities, yet the unique context of local authorities in rural or suburban areas is rarely discussed. Furthermore, (Zhang et al., 2022) demonstrated that staff competency significantly influences the success of digital transformation but did not delve into specific mechanisms relevant to the local scale. Similarly, (Almuqrin et al., 2022) highlighted the importance of public trust in driving e-government adoption overall but primarily focused on public perceptions without linking these to policy strategies at the local level. These studies indicate a significant gap in understanding how factors such as infrastructure, staff competencies, and public trust combine to influence the adoption of digital technology at the local authority level.

Moreover, in-depth empirical approaches to examining the factors influencing e-government adoption by local authorities remain scarce. Previous studies often rely on qualitative or descriptive approaches without comprehensive quantitative analyses. For instance, (Xin et al., 2022) identified several barriers to e-government adoption but did not provide statistically testable

models. Similarly, as discussed in (Jiang et al., 2022), cultural, social, and economic differences at the local level are often overlooked in national-scale studies. Quantitative research linking technological infrastructure, staff competencies, and public trust is also rare. This study aims to fill these gaps by identifying the key factors influencing e-government adoption by local authorities through a quantitative approach. By doing so, this research seeks to offer strategic insights relevant to supporting digital transformation policies in public governance.

This study seeks to identify the key factors influencing the adoption of e-government services by local authorities. Using a quantitative approach, not only provides an in-depth empirical analysis but also offers strategic insights to enhance the adoption of digital services. The approach involves systematic data collection to measure the relationships between relevant variables, such as technological infrastructure, staff competencies, and public trust. The analysis is expected to provide empirical evidence supporting the development of more targeted implementation strategies, particularly at the local level. Additionally, the study aims to address existing knowledge gaps by exploring the unique context of local authorities, which is often overlooked in previous research. The findings are expected to contribute not only to the development of more effective policies to support digital transformation in public governance but also to establish a foundation for further research in this field.

## **II. LITERATURE REVIEW**

### *A. E-Government and Public Governance*

E-government, as explained by (Tejedo-Romero et al., 2022), refers to the use of Information and Communication Technology (ICT) to enhance transparency, efficiency, and participation in public governance. (Umbach & Tkalec, 2022) further elaborate that this concept encompasses digital interactions between governments and citizens (G2C), governments and businesses (G2B), as well as intergovernmental collaboration (G2G). Their research emphasizes that the primary goal of e-government is to digitize administrative processes, creating more integrated and responsive public services. Globally, (Castro & Lopes, 2022) note that implementing e-government has become a key governmental strategy to address the increasingly complex needs of society in the digital era. This approach not only fosters bureaucratic modernization but also enhances governments' competitiveness in delivering quality public services.

The primary benefits of e-government lie in operational efficiency and the improved quality of public services. (Di Giulio & Vecchi, 2021) argue that the digitalization of administrative processes enables governments to reduce operational costs while accelerating the provision of

more accessible public services. Additionally, a report by the World Bank (2020) highlights that countries with advanced digitalization levels have experienced increased public trust in their governmental institutions. (Zou et al., 2023) add that e-government plays a critical role in enhancing transparency by providing open access to policy and budget information, allowing the public to monitor decision-making processes directly. Through the adoption of more transparent digital systems, e-government has become a vital tool for fostering accountable governance that is more responsive to societal needs.

Beyond improving efficiency, e-government significantly contributes to social inclusion and public participation in decision-making processes. (Singh & Chobotaru, 2022) find that well-designed e-government services can effectively reach vulnerable groups, including those in remote areas and individuals with disabilities. These services offer equitable access to government information and services that were previously difficult for such groups to obtain. This finding is supported by (AbdulKareem & Oladimeji, 2024), who highlight that the success of e-government implementation is heavily influenced by social factors, such as digital literacy levels and public trust in the security and credibility of the systems employed. In this context, models such as the TAM have been widely used to explain the factors influencing e-government adoption. This model focuses on how public perceptions of the ease of use and the benefits of technology impact their decisions to utilize digital services offered by the government.

Furthermore, e-government not only revolutionizes data management and digital service delivery but also signifies a broader transformation in public governance amidst global changes. (Goloshchapova et al., 2023) reveal that digitalization through e-government brings significant changes to bureaucratic culture and governmental organizational structures, making them more flexible and responsive to societal demands. Their study also underscores how this technology strengthens the relationship between governments and citizens by creating new dialogue spaces through digital platforms, enabling active citizen participation. Additionally, e-government presents opportunities for governments to enhance transparency and accountability two critical elements of modern governance. Through this transformation, e-government has emerged as a primary tool for strengthening government-citizen interactions and revolutionizing public service delivery in the digital era.

### *B. Technology Acceptance Model for Explaining Technology Adoption*

The TAM has been widely recognized as an effective theoretical framework for explaining technology adoption, including in the context of e-government. (Natasia et al., 2021) developed this model based on two primary variables: perceived ease of use and perceived usefulness, which are considered pivotal in influencing users' decisions to adopt technology. Within the context of e-government, these variables are utilized to understand how citizens and local authorities accept digital government services. (Metallo et al., 2022) expanded TAM by incorporating social factors, such as subjective norms, to account for the influence of organizational culture and social interactions on technology acceptance at the local government level. This provides a robust theoretical foundation for evaluating the factors influencing the successful implementation of e-government.

In the realm of digital governance, TAM is frequently employed to analyze the factors that affect the adoption of e-government services by local authorities. (Nguyen et al., 2024) emphasize that the model can explain the impact of both technical and social variables on technology adoption decisions in the public sector. In studies on e-government, perceived usefulness is particularly relevant for understanding how digital government services can enhance administrative efficiency and simplify public access to information. For example, (David et al., 2023) found that technology acceptance in the public sector often depends on its ease of use, especially for user groups with low digital literacy. These findings underscore the importance of designing intuitive e-government services to encourage broader participation among the public and local authorities.

The application of TAM in examining the acceptance of e-government services also encompasses external factors that are highly relevant to public governance, such as policy support and public trust in technology. (Méndez-Rivera et al., 2023) reveal that trust in data security and privacy protection plays a critical role in driving e-government adoption, particularly at the local government level. Trust becomes a key element because users are reluctant to engage with digital services if they feel their personal data is not adequately protected. Additionally, government support in providing adequate technological infrastructure significantly influences perceptions of the usefulness of such services from the perspectives of both citizens and local authorities. Reliable infrastructure, such as fast and secure internet access, forms a strong foundation for the successful implementation of e-government. These factors are particularly important in the adoption of digital services by local authorities, as they directly affect the government's ability to deliver dependable, secure, and widely accessible services, especially in areas previously underserved by technology.

In the digital governance era, TAM serves not only as a tool for understanding the technical and social factors influencing technology adoption but also as a framework for evaluating the success of e-government implementation through a quantitative approach. (Madias et al., 2023) highlight that TAM-based quantitative analysis enables the identification of relationships among key variables such as perceived ease of use, perceived usefulness, and public trust in digital services. Their research demonstrates that quantitative analysis provides detailed insights into the extent to which these factors influence technology acceptance across various user groups. By interpreting this data, local governments can identify specific adoption barriers, such as low digital literacy or resistance to technological change. This information allows them to design more targeted strategies, such as user training programs or campaigns to raise awareness of technology benefits. Ultimately, this approach supports the transformation of public governance into a more adaptive, inclusive, and responsive digital era that effectively meets societal needs.

### *C. Previous Studies*

#### 1. Studies on E-Government Adoption at National and Local Levels

The adoption of e-government continues to be a significant topic in digital governance studies, both at national and local levels. According to (Agboola et al., 2023), governments utilize ICT to enhance operational efficiency, strengthen transparency, and foster public participation in governmental services. However, as (Zioło et al., 2022) pointed out, that the success of e-government adoption is not solely determined by the availability of technology but also by the technical, political, and social readiness of each country or region. At the national level, e-government implementation often focuses on centralized initiatives aimed at providing uniform services to all citizens. Conversely, at the local level, more decentralized approaches are frequently adopted to tailor services to the specific needs of communities. These differences create significant variations in how technology is integrated into governance systems and accepted by the public, reflecting both challenges and opportunities in the broader implementation of e-government.

The factors influencing e-government adoption at national and local levels have been extensively discussed in numerous studies. (Li & Shang, 2023) found that public trust in government and the security of technology play critical roles in determining the level of acceptance of digital services. This trust is often shaped by citizens' experiences in using digital services, particularly concerning the protection of personal data and the transparency of governmental operations. At the local level, research by (Iong & Phillips, 2023) revealed that the success of e-government adoption is closely linked to the availability of resources, such as technological infrastructure and staff competencies. Additionally, external factors, such as community involvement and local political

support, significantly impact the successful implementation of e-government. These factors not only help build public support but also establish a foundation for the sustainable operation of digital services at the local level. This research highlights that while the objectives of e-government implementation at national and local levels may be similar, the strategies employed must consider differences in social and administrative contexts. Failure to address these differences could hinder the achievement of e-government's primary goals, which include creating more efficient, transparent, and responsive public services.

Other studies emphasize the fundamental differences in the usage patterns of e-government services at the national and local levels. (Raca et al., 2022) noted that national e-government services often focus on providing broad access to information, such as open data portals covering various government sectors. In contrast, local e-government services tend to address practical community needs, such as regional tax payment systems, business license management applications, or other specific administrative services. Furthermore, the study highlighted that digital literacy levels among citizens are a critical factor influencing the effectiveness of e-government services, particularly in areas with limited technological access. This challenge is especially pronounced in rural regions, where inadequate technological infrastructure often hampers the support of digital-based services. The differences between urban and rural conditions illustrate the complexity of implementing e-government at the local level. These factors underscore the necessity of a deep understanding of the social and technical dynamics in each region to enhance the success of e-government services.

Research in this field also underscores the importance of quantitative data analysis in understanding e-government adoption at the local level. (Alhadid et al., 2022) emphasized that quantitative analysis can help identify key variables influencing the adoption of digital services, such as perceived ease of use, perceived benefits, and the level of public trust in these services. This approach enables systematic evaluation of the relationships among these factors, providing clearer insights into the patterns of public acceptance of technology. Moreover, the study demonstrated that these variables have varying influences depending on the social and cultural contexts of different regions. Accurate measurement of these variables offers local governments a detailed picture of the barriers and opportunities in implementing e-government services. Such understanding clarifies the relationship between technological readiness and public acceptance of digital services at the local level. This type of analysis also serves as a foundation for mapping the varied patterns of technology use across regions. Table 1 presents a comparison of previous studies outlining the focus, methods, and key findings related to e-government adoption in different regions. This table provides an overview of the factors contributing to successful implementation at both national and local levels.

**Table 1. Comparison of Previous Studies on E-Government Adoption in Various Regions**

Study	Focus	Key Findings
(Agboola et al., 2023)	Utilization of technology to enhance efficiency, transparency, and public participation in governance.	The success of e-government adoption depends on the technical, political, and social readiness of each region.
(Zioło et al., 2022)	The role of public trust in government and technology security in e-government adoption.	Trust in technology security is a critical factor in the acceptance of digital services at both national and local levels.
(Li & Shang, 2023)	Availability of resources and their impact on the success of e-government at the local level.	Technological infrastructure and staff competence are key elements for successful implementation at the local level.
(Iong & Phillips, 2023)	Differences in the usage patterns of e-government services between national and local levels.	The public's digital literacy and the availability of technological infrastructure affect the effectiveness of e-government services, particularly in rural areas.
(Raca et al., 2022)	Technical, political, and social readiness in e-government adoption.	Successful implementation is influenced by technology integration and adaptation to the needs of local communities.
(Alhadid et al., 2022)	Identification of key variables influencing e-government adoption at the local level.	A quantitative approach helps identify relationships between key variables that influence public acceptance patterns of technology.

## 2. E-Government Factors Influencing the Successful Implementation of E-Government

The successful implementation of e-government in digital governance is influenced by various interrelated factors. One of the primary factors is the readiness of technological infrastructure, which includes internet networks, hardware, and software that support the operationalization of digital services. (Xiao et al., 2022) emphasize that robust technological infrastructure is a crucial foundation for governments to provide reliable and efficient services to the public. Additionally, technological readiness also encompasses the organization's ability to integrate technology into comprehensive administrative processes. (Kumar et al., 2023) highlight that inconsistency in technology management often delays e-government adoption, particularly in regions facing limitations in technological resources. Therefore, adequate infrastructure and effective management play a significant role in supporting the successful implementation of digital services in the governmental sector.

In addition to infrastructure, the competence of human resources involved in managing digital services also plays an essential role. (Hariguna et al., 2022) underline that government staff's mastery of technology has a direct impact on the quality of e-government services delivered. This competence includes technical skills as well as the ability to understand public needs and translate

them into effective digital solutions. (Trujillo-Gallego et al., 2022) add that training and capacity development of human resources are critical elements to ensure the sustainability of digital service operations. An organization's ability to foster a work environment that supports technological innovation is also a factor that cannot be overlooked. Well-planned change management further serves as a key to ensuring a smooth transition towards digital governance.

The level of digital literacy among the public is also a crucial factor in the implementation of e-government. (Arion et al., 2024) find that low digital literacy often poses a barrier to the use of e-government services, particularly in rural areas. Digital literacy includes the public's ability to access, comprehend, and utilize technology effectively when interacting with government services. This challenge is often exacerbated by the digital divide between urban and rural areas, where access to technology remains limited in regions with inadequate infrastructure. (Wu, 2024) shows that public perceptions of the benefits and ease of digital services are strongly influenced by their level of digital literacy. This factor highlights the significant role of digital literacy in fostering public participation in e-government services.

Furthermore, public trust in digital services is also an important factor influencing the adoption of e-government. (Aldboush & Ferdous, 2023) reveal that data security and privacy are key aspects affecting public trust in digital technology. Perceptions of how well personal data is protected by the government have a significant impact on the level of service usage. (Alkrajji & Ameen, 2022) add that trust is shaped by user experience, service transparency, and the reputation of government institutions. A robust regulatory framework, particularly in data protection and privacy, also plays a role in enhancing public confidence in digital services. Thus, public trust in service security is a critical dimension in understanding the dynamics of e-government implementation across regions.

### **III. RESEARCH METHOD**

The research method adopts a quantitative approach, with surveys as the primary method of data collection. This approach was selected because it provides the ability to evaluate measurable relationships between independent factors such as digital infrastructure, staff competence, and public perception and the adoption of e-government services by local authorities. This approach also facilitates the systematic and objective collection of data, ensuring that the research findings are reliable and applicable to similar contexts. The research population consists of local authorities across various regions with diverse characteristics, enabling the exploration of significant differences among respondent groups. From this population, a total of 150 local authorities were selected as the sample using a random sampling technique, which ensures that each member of the population has an equal chance of being chosen. This sampling process was

designed to avoid bias and ensure fair representation so that the research results reflect the general conditions of the entire population.

The research instrument uses a questionnaire as the primary tool to collect relevant data on the factors influencing the adoption of e-government services. The questionnaire was carefully designed to ensure that the data obtained provides in-depth insights into the topic being studied. In its construction, a Likert scale was utilized because it enables respondents to provide responses systematically and consistently, thereby facilitating quantitative measurement and data analysis. This study measures three main dimensions: the quality of digital infrastructure, staff competence in utilizing technology, and public perceptions of the effectiveness of digital services. These three dimensions were selected based on the consideration that each significantly influences the level of success in e-government adoption. To complement the analysis, a description of respondent characteristics, presented in Table 2, provides a profile of the local authorities participating in the research. The data in this table presents essential information regarding respondent backgrounds, which helps explain the relationships between the measured factors and the context of e-government implementation in the research areas.

**Table 2. Description of Respondent Characteristics**

Characteristic	Category	Frequency (n)	Percentage (%)
Region Type	Urban	90	60.0
	Rural	60	40.0
Staff Education Level	Undergraduate	100	66.7
	Postgraduate	50	33.3
Population Size	< 100.000	70	46.7
	≥ 100.000	80	53.3

The collected data were analyzed using the linear regression method, which aims to identify the relationships between independent variables and the dependent variable. This method was chosen for its ability to measure the direct influence of independent variables on the dependent variable, as well as to evaluate the strength of those relationships. Linear regression analysis also enables researchers to test the statistical significance of the relationships between variables, thus providing a deeper understanding of the patterns present in the data. The linear regression model used in this research can be expressed with Equation (1):

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \dots + \beta_n X_n + \epsilon \quad (1)$$

In this model,  $Y$  represents the level of e-government service adoption as the dependent variable, which serves as the main focus of this research. Meanwhile,  $X_n$  includes several independent variables, such as digital infrastructure ( $X_1$ ), staff competence ( $X^2$ ), and public perception ( $X^3$ ), which theoretically contribute to variations in the dependent variable. The regression coefficients ( $\beta^n$ ) illustrate the magnitude of the influence of each independent variable on the dependent

variable, with positive or negative signs indicating the direction of the relationship. Additionally, the error term ( $\epsilon$ ) accounts for elements outside the scope of the model that may affect the dependent variable, ensuring the accuracy and validity of the model. To support an initial understanding of the data used, Table 3 presents the descriptive statistics of the main research variables, including the mean, standard deviation, and range of values for each variable. These statistics provide an overview of the data distribution, facilitating the interpretation of the regression analysis results.

**Table 3. Descriptive Statistics of Research Variables**

Variable	Mean	Standard Deviation (SD)
Digital Infrastructure	3.85	0.65
Staff Competence	4.10	0.70
Public Perception	3.75	0.80

This analysis demonstrates that the method employed can effectively identify significant factors influencing the adoption of e-government services by local authorities. The analysis process involves testing the relationships between independent and dependent variables to determine which factors have the greatest influence. Moreover, this method also allows for further exploration of the interactions between variables, providing a more detailed understanding of the dynamics within the context of digital service implementation. The analyzed data encompasses various dimensions, such as digital infrastructure, staff competence, and public perception, which are relevant to the successful adoption of e-government services. The results of this analysis offer in-depth insights into existing patterns within the data, thereby enriching the information obtained from the study. This approach also ensures that the identified factors are supported by sufficient empirical evidence.

#### IV. RESULT

##### A. Regression Analysis Results

This study analyzes the effect of three main independent variables—Digital Infrastructure, Staff Competence, and Public Perception on the adoption of e-government services by local authorities. The analysis provides insights into the relationships between these variables and the level of digital technology implementation in local governance. The regression analysis results indicate that all three variables have a significant influence, with the coefficient values reflecting the magnitude of each variable's contribution to the adoption level. Table 4 presents the regression coefficients and statistical significance values for each independent variable, highlighting their roles in influencing the dependent variable. Digital Infrastructure, Staff Competence, and Public Perception positively contribute to the adoption of e-government services, as demonstrated in the regression analysis. These findings indicate a strong relationship between the quality of

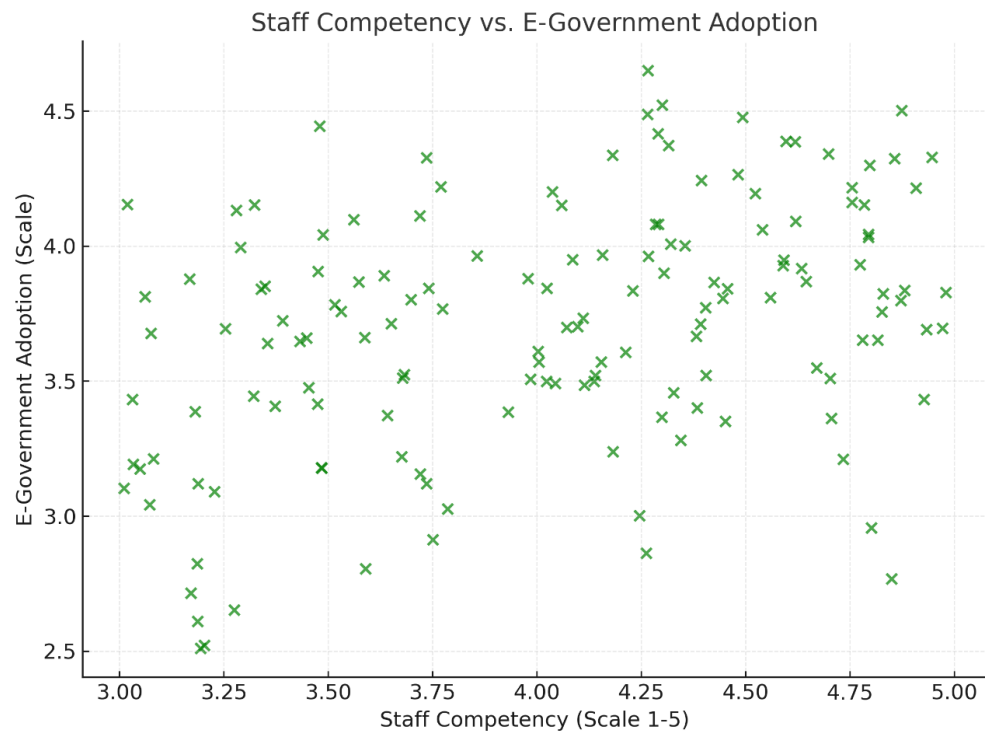
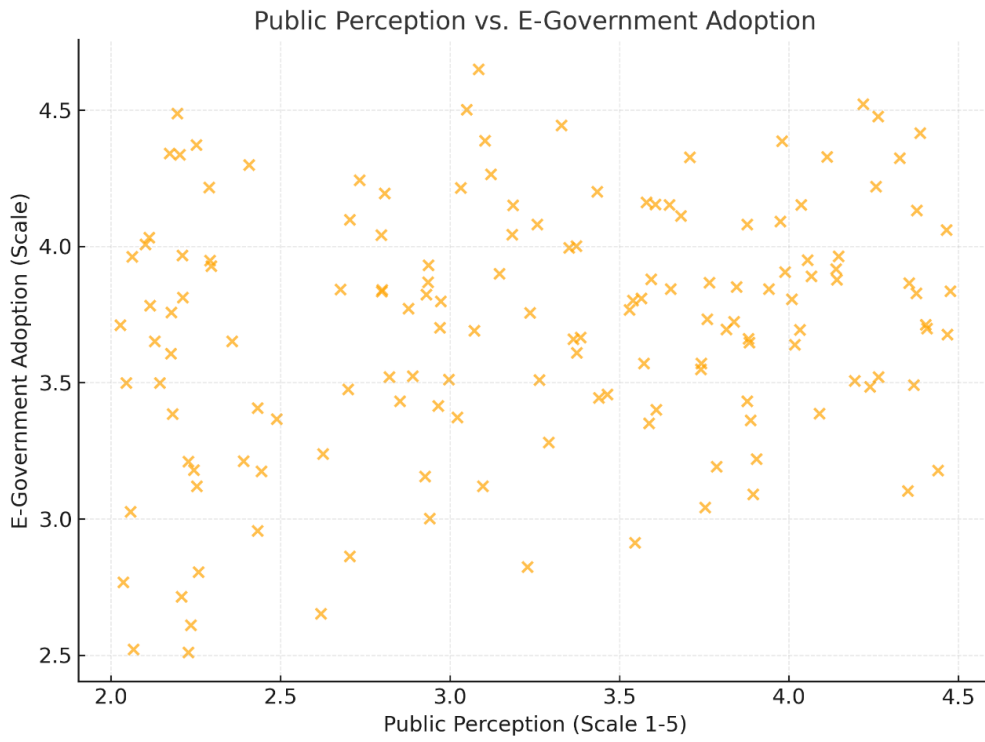
technology infrastructure, human resource capability, and public perception in supporting the adoption of e-government services.

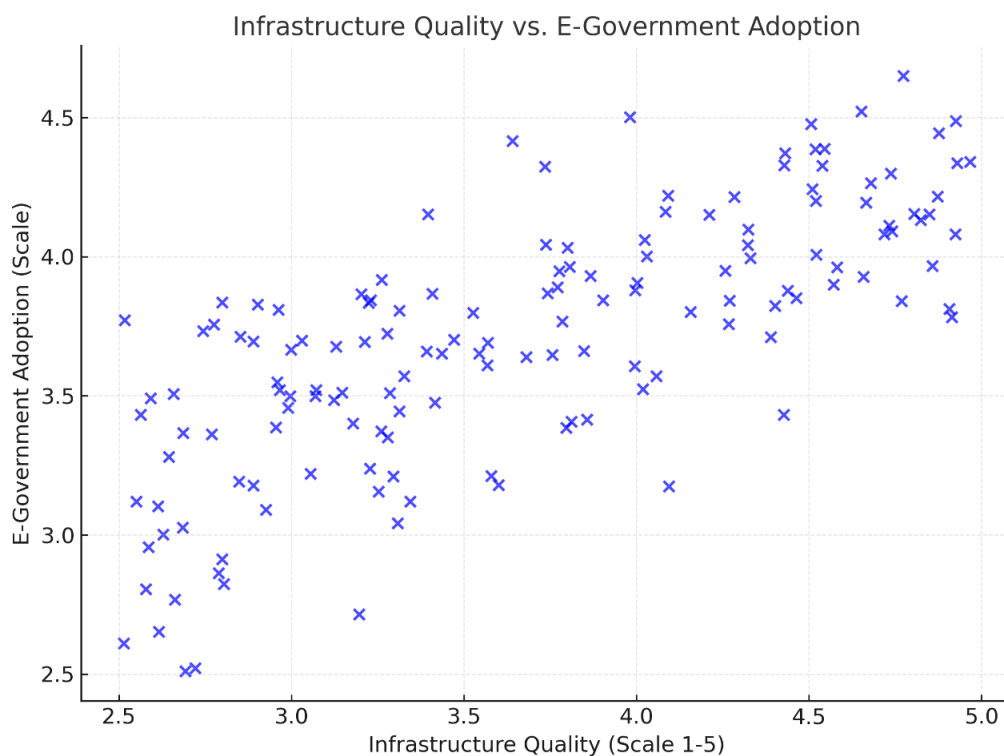
**Table 4. Regression Coefficients and Statistical Significance**

Independent Variable	Coefficient ( $\beta$ )	p-value	Description
Digital Infrastructure	0.45	0.001**	Significant
Staff Competence	0.35	0.015**	Significant
Public Perception	0.25	0.045**	Significant
R <sup>2</sup>	0.65	-	Good model fit

The interpretation of the regression coefficients reveals that each independent variable significantly influences the adoption of e-government services by local authorities. Digital Infrastructure ( $\beta = 0.45$ ,  $p = 0.001$ ) makes the largest contribution, with a positive coefficient indicating that the quality of digital infrastructure significantly enhances the adoption of e-government services. This finding aligns with previous studies that emphasize the importance of digital connectivity and adequate technology in supporting technology-based service adoption. Staff Competence ( $\beta = 0.35$ ,  $p = 0.015$ ) also has a significant influence, indicating that staff with sufficient technological skills are more capable of effectively managing digital services, thereby supporting system sustainability. Public Perception ( $\beta = 0.25$ ,  $p = 0.045$ ) provides a moderate but significant contribution, with results suggesting that public trust in the security and benefits of digital services plays a role in increasing technology acceptance. With an R<sup>2</sup> value of 0.65, the regression model demonstrates that 65% of the variance in e-government adoption levels can be explained by these three variables, indicating a robust and relevant model for explaining the phenomenon.

The relationship between the independent variables and the level of e-government service adoption can also be analyzed through the scatterplot presented in Figure 1. This scatterplot provides a visual representation of the relationship patterns between digital infrastructure, staff competence, and public perception with the level of digital technology adoption in local governance. The positive relationships observed in the scatterplot indicate that improvements in the quality of each independent variable tend to be accompanied by increases in the adoption level of e-government services. This graphic also helps identify the data distribution, including general patterns and potential outliers that may affect result interpretation. The scatterplot analysis is crucial for verifying the consistency of the linear regression results while providing additional understanding of the dynamics between variables. Therefore, Figure 1 serves as a critical visual element for comprehensively illustrating the interrelationships among the studied variables.



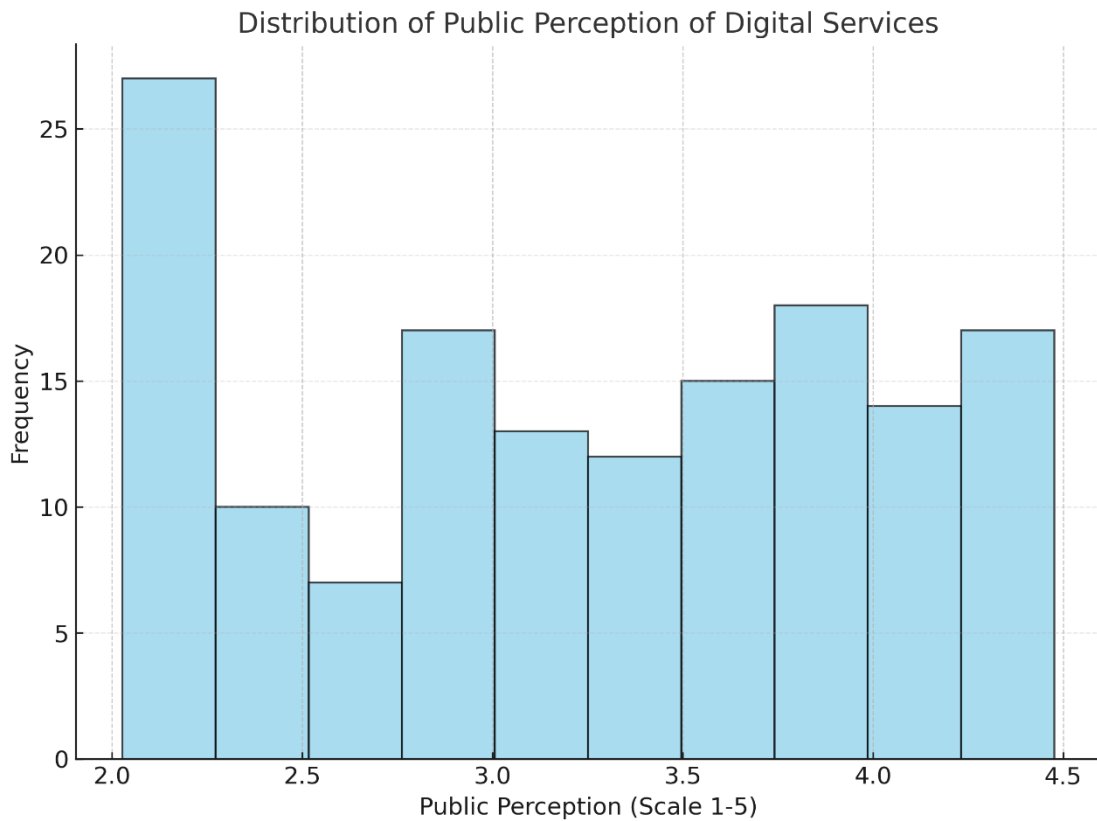


**Figure 1. Scatterplot of the Relationship Between Independent Variables and E-Government Adoption**

Figure 1 presents a scatterplot illustrating the relationship between each independent variable and the level of e-government service adoption. For the Digital Infrastructure variable, a consistent positive pattern is evident, where improvements in digital infrastructure quality correlate with an increase in the adoption of e-government services. This relationship suggests that regions with better infrastructure tend to be more successful in adopting digital technologies for public services. For the Staff Competence variable, the scatterplot also shows a clear positive relationship, although there are a few outliers indicating variability in the data. This finding suggests that, while most regions with competent staff exhibit higher levels of adoption, there are certain cases where the outcomes do not entirely align with this general pattern. The Public Perception variable demonstrates a more moderate positive relationship compared to the other two variables, with the scatterplot indicating a smaller contribution to the level of adoption. Overall, the scatterplot supports the results of the regression analysis, showing that all three independent variables have a positive relationship with the level of e-government adoption, although the degree of influence varies among the variables.

The distribution of public perceptions toward digital services provides essential insights into how the technology is received by its users. These perceptions reflect the extent to which the public understands, accepts, and trusts the digital services provided by local governments. The

distribution graph presented in Figure 2 illustrates variations in perception levels, ranging from highly positive to more critical views. This distribution analysis not only represents the majority perception but also identifies certain groups that may harbor doubts regarding digital services. Such information is vital for understanding the overall adoption patterns of technology, including the factors that influence public acceptance levels. By acknowledging these diverse perceptions, governments can develop more effective strategies to foster public trust in digital technologies.



**Figure 2. Distribution of Public Perception Toward Digital Services**

Figure 2 displays the distribution graph of public perceptions toward digital services, which reveals diverse patterns among respondents. The majority of respondents exhibit positive perceptions, with scores ranging from 3.5 to 4.5, reflecting a generally favorable view of the digital services provided. However, a small group of respondents report low perceptions, with scores below 3, indicating segments of the population that lack confidence in the security or benefits of digital services. This distribution underscores that, while most of the public holds supportive views, there remain perception gaps that warrant further attention. Factors such as service transparency, education about the benefits of technology, and data security assurances could be key considerations for addressing these negative perceptions. Thus, the results of this distribution provide crucial insights into the heterogeneity of public perceptions toward digital

services. This information can be leveraged to identify both the challenges and opportunities in technology adoption, offering a more comprehensive understanding of the dynamics influencing e-government service adoption.

## V. DISCUSSION

The findings of this study indicate that digital infrastructure, staff competence, and public perception are the primary factors influencing the level of e-government service adoption by local authorities. Digital infrastructure, which includes reliable internet networks and adequate hardware, has been shown to have the most significant impact. In the context of the TAM, digital infrastructure directly influences perceived ease of use, a core component of the model. Adequate infrastructure allows users to access and utilize digital services more easily, thereby increasing technology adoption. This finding aligns with the study by (Xiao et al., 2022), which emphasizes the importance of infrastructure as the foundation for successful digital transformation. These results also support TAM theory by highlighting that ease of access to technology influences public acceptance and usage of digital services.

Staff competence also has a significant influence on the adoption of e-government services. Within the TAM framework, staff competence can be regarded as an external factor that affects the perceived usefulness of digital technology. Competent staff are able to manage and deliver services more efficiently, enabling the public to experience tangible benefits from the use of technology. This study supports the findings of (Metallo et al., 2022), who extended TAM by incorporating subjective norms and social factors within an organizational context. Staff competence also strengthens the positive relationship between government and society, enhancing public perception of digital services as relevant and beneficial solutions to their needs. This underscores the importance of continuous training, as suggested by (Trujillo-Gallego et al., 2022), to ensure that the benefits of e-government services can be fully realized by the public.

Public perception of the security and benefits of digital services serves as a key element in technology adoption, as explained in TAM through the influence of perceived usefulness and perceived ease of use. Positive public perception of digital service security increases trust and motivates users to utilize such services. This finding aligns with the study by (Aldboush & Ferdous, 2023), which highlights that trust in data security is a crucial factor in enhancing technology acceptance. Furthermore, the results extend the application of TAM by showing that digital literacy also influences perceived usefulness, as noted by (Arion et al., 2024). In this context, digital literacy can be viewed as a prerequisite to ensuring that the public understands the ease and benefits of digital technology, ultimately driving higher levels of adoption.

Compared to studies in other regions, the findings of this research demonstrate that the factors influencing e-government adoption are contextual. This study adds that factors such as digital infrastructure and staff competence provide a more significant contribution at the local level, particularly in areas with limited technological access. This approach aligns with TAM, which posits that perceptions of ease of use and usefulness are influenced by the unique social, economic, and technical contexts of each region. The study complements the findings of (Elmatsani et al., 2024), which focus on the role of leadership in large cities, by asserting that at the local level, the primary priorities are enhancing infrastructure and staff competence to support positive public perceptions. Thus, this study makes a valuable contribution to the existing literature and offers practical insights for accelerating digital transformation through theory-driven and community-centered approaches.

## **VI. CONCLUSION AND RECOMMENDATION**

This study affirms that digital infrastructure and staff competence are the two primary factors influencing the adoption of e-government at the local government level. High-quality digital infrastructure plays a critical role in delivering reliable, efficient, and accessible digital services to various segments of society. This infrastructure includes the availability of a stable internet network, adequate hardware, and software that supports optimal service operations. On the other hand, staff competence not only encompasses technical proficiency but also managerial capabilities and a deep understanding of the needs of society as users. Such competence serves as a key element in ensuring that the adopted technology can be effectively managed and supports the successful implementation of e-government. Additionally, public perception of digital services plays a significant role in determining the success of technology adoption. Positive perceptions, particularly those related to the security of personal data and the tangible benefits of digital services, greatly influence public trust. By understanding the importance of infrastructure, staff competence, and public perception, this study offers strategic insights that can be used to formulate more effective policies to accelerate the adoption of e-government at the local level.

To ensure the sustainability of e-government adoption, the government is advised to increase investment in staff training, particularly to strengthen their technical competencies and adaptability to technological changes. Such training is not only aimed at updating staff's technological skills but also at enhancing their ability to address challenges arising during the digital transformation process. In addition, improving digital infrastructure, such as providing fast, secure internet networks that reach remote areas, must be a top priority in digital transformation policies. These efforts aim to reduce the digital divide, which remains a major obstacle in implementing e-government across various regions. Public education campaigns are

also necessary to improve digital literacy among citizens. These campaigns can help emphasize the long-term benefits of digital services and explain the measures taken by the government to ensure user data security. Furthermore, future research needs to expand its scope to include variations in social, economic, and geographical characteristics to gain a more comprehensive understanding of the dynamics of e-government adoption. With a more holistic approach, future research findings are expected to make significant contributions to accelerating digital transformation in the public sector while simultaneously improving the quality of services delivered to the public.

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