

Effects of E-Government and Digital Competence on Civil Servants Individual Performance: The Mediating Role of Employee Engagement with Evidence from the North Luwu Regency Government

Hardiansyah Harahap^{1*}, Suhardi M. Anwar², Antong³, Husmaruddin⁴, Isti Darisofia Palembang⁵
¹²³⁴⁵Universitas Muhammadiyah Palopo, 91922, Indonesia

Corresponding Author Email: callmedhiy@gmail.com

Abstract

This study examines the impact of e-government implementation and digital competence on the civil servants individual performance, with employee engagement as the connecting factor. The issue addressed is the gap between the presence of technology and evidence of improved work outcomes. The study aimed to assess the direct and indirect effects of these two factors, as well as the role of engagement. The method used was a survey of 267 officials in the North Luwu Regency government. Respondents' responses were analyzed to determine the strength of the relationship between the elements studied. The results indicate that the e-government implementation and digital competence both increase engagement. Digital competence also has a direct impact on performance. Engagement has a strong influence on performance and serves as an important channel through which the impact of technology and capabilities on work outcomes. The direct effect of system implementation on performance is not as strong without engagement. The study's conclusions suggest strengthening task-relevant digital capabilities, simplifying service flows, integrating applications, and providing prompt technical support, while monitoring engagement as an early indicator. These findings provide a basis for practical policies to ensure that digital programs lead to tangible employee performance.

Keywords: civil_servants; individual_performance; digital_competence; e-government_implementation; employee_engagement;

1. Introduction

Digital transformation in the public sector is changing the way governments design, manage, and evaluate services. The value of technology does not arise from applications alone, but rather when organizational processes, governance, and human resources move in unison [1], [2]. In Indonesia, the e-government framework is used to digitize public services, internal processes, and data governance across government units and levels [3]. At the international level, the Digital Government Index emphasizes user-orientation, data utilization, openness, and interoperability as prerequisites for technology to generate public value [4].

North Luwu Regency in South Sulawesi provides a relevant empirical context because digital reform in this region is being implemented through the e-government program within the Regional Apparatus Organization (OPD). The vast nature of the region and the services that reach sub-districts and villages demand efficient, documented, and consistent work processes. In such circumstances, e-government is not simply a technology, but rather a work coordination infrastructure that clarifies workflows, reduces repetitive tasks, and enables faster, data-driven performance monitoring [3], [4].

E-Government Implementation as a Job Resource

In practice, the implementation of e-government in OPDs includes the digitization of key work processes, cross-unit application integration, standardization through SOPs and training, adequate information technology support, and data-based performance monitoring. The quality of implementation naturally varies across OPDs due to differences in service mandates,

workloads, and employee readiness. Empirical evidence shows that government digital transformation tends to be effective when technological capabilities are tied to clear processes and governance, not just application procurement [1], [2]. Within the Job Demands-Resources (JD-R) framework, effective e-government implementation can be viewed as a job resource that provides clarity of flow, reduces obstacles, and offers performance feedback, thereby enhancing employee energy and dedication [14].

Digital Competence as Human Capital

At the individual level, the adoption and use of digital work systems are often explained by the Technology Acceptance Model (TAM) and the Unified Theory of Acceptance and Use of Technology (UTAUT) and its development, UTAUT2. These three frameworks emphasize the role of perceived usefulness, ease of use, performance expectations, effort expectations, social influence, and facilitating conditions in shaping usage intentions and behavior [5]–[7]. However, beyond intentions, digital competency is the set of knowledge, skills, and attitudes that enable employees to work effectively and safely in digital ecosystems. DigComp 2.0 and DigComp 2.2 map competencies into five domains: information and data literacy, communication and collaboration, content creation, safety, and problem-solving [8], [9]. Evidence in the public sector shows that digital competency is associated with service quality and individual performance [10], [11]. In the North Luwu Regional Apparatus Organization (OPD), this competency determines whether the e-government platform is actually used to solve daily work problems such as document automation, simple data processing, and cross-application collaboration.

Employee Engagement as a Connecting Mechanism

The key question is not simply whether technology and digital competencies impact performance, but how that influence flows. From an organizational behavior perspective, employee engagement is reflected in energy, dedication, and immersion in work. Kahn proposed three psychological states that foster engagement: meaningfulness, security, and resource availability [12]. A concise and reliable measure is available through the 9-item version of the Utrecht Work Engagement Scale (UWES), which has been validated across countries [13]. The JD-R model predicts that job resources and personal resources such as clarity of digital flows, technical support, and digital competencies will enhance engagement, and that engagement will then drive task performance and contextual performance [14]. Meta-analytic evidence indicates that engagement is positively correlated with various performance indicators [15], and these findings are consistent across organizational contexts [16].

In the North Luwu Regional Apparatus Organization (OPD), a clearer, technically supported digital work experience has the potential to increase engagement before its effects are reflected in daily performance indicators. This means that well-designed digital interventions tend to strengthen civil servants' work ethic and focus, which in turn improves performance.

Civil Servants Individual Performance

The Civil Servants Individual Performance is the observed output of work behavior at the employee level, not simply the aggregate unit figures. Conceptually, individual performance encompasses two main domains expected by the organization: task performance and contextual performance.

Individual-level measurement is important because the quality of e-government and digital competency implementation is not uniform across OPDs. Relying solely on aggregate indicators risks masking variations between employees and leading to misinterpretation at the ecological level. By capturing employee-level performance using the IWPQ [17], this study allows for a more precise examination of the mechanism: whether e-government and digital competency implementation (as job and personal resources) actually improve employee engagement, and ultimately performance.

In the Indonesian context, empirical evidence at the local government level is also beginning to strengthen. A cross-study of 383 district/city governments using PLS-SEM showed that technological, organizational, and environmental factors significantly drive e-government maturity [31]. At the organizational level, research at the Indragiri Hilir Regency Secretariat found that e-performance systems and HR competencies influenced employee performance, with motivation as an intermediary variable [32]. In the provincial government apparatus sector, pre-post evaluations of e-government implementation showed improvements in the quantity, quality, and punctuality of employee work [33]. From the perspective of civil servants behavior, quantitative studies within the local government environment also confirmed a positive link between self-efficacy and work engagement, which emphasizes the role of personal resources in driving engagement [34]. These domestic findings strengthen the argument that there is a chain of influence at work: technology drives increased resources at work and personal resources, improvements in both types of resources then increase engagement, and higher engagement ultimately leads to better performance. This chain is worth testing simultaneously in the context of OPDs in North Luwu.

This study follows current PLS-SEM reporting practices, namely examining discriminant validity with HTMT [2], assessing predictive relevance and model fit [25], and testing mediation following indirect effects-based recommendations [30]. Thus, this study produces evidence that is more comparable and more useful for policy formulation.

Research Purposes

In line with the theoretical framework and regional policy needs, this study sets seven objectives:

- 1) Testing the effect of e-government implementation on employee engagement.
- 2) Testing the influence of digital competence on employee engagement.
- 3) Testing the impact of e-government implementation on Civil Servants Individual Performance.
- 4) Testing the influence of digital competence on the Civil Servants Individual Performance.
- 5) Testing the influence of employee engagement on the Civil Servants Individual Performance.
- 6) Testing the mediating role of employee engagement in the relationship between e-government and Civil Servants Individual Performance.
- 7) Testing the mediating role of employee engagement in the relationship between digital competence and Civil Servants Individual Performance.

To address these objectives, this study employed a quantitative approach with Partial Least Squares–Structural Equation Modeling (PLS-SEM) analysis. This method was chosen because it is suitable for testing complex causal models with many latent variables and indicators, and is tolerant of non-normal data distributions.

Hypothesis Formulation

The implementation of e-government in government is intended to support transparency, accelerate workflow, and improve the quality of public services. Digitization of key processes, application integration, provision of SOPs and training, and IT infrastructure support are not only technical aspects, but also job resources that can strengthen civil servants engagement to their work within the JD–R framework [14]. Empirical findings in the Indonesian context show that when the organizational work system is clear and the facilities are supportive, employee engagement increases [38], [39]. Therefore, in the context of the North Luwu Regency Government, it is reasonable to assume that the better the implementation of e-government, the higher the employee engagement of civil servants. Thus, the first hypothesis is formulated:

H1: e-government implementation has a positive and significant effect on employee engagement.

In addition to system support, employee engagement is also largely determined by individual capacity. Civil servant digital competencies including core application skills, data management skills, digital security awareness, and simple technical problem-solving skills, provide confidence in facing technology-based work demands. Evidence in Indonesia and internationally confirms that digital capabilities are closely correlated with work effectiveness and employee engagement [10], [40], [41], [43]. From this, it can be concluded that civil servants with high digital competencies will be more engaged in their work. Therefore, the second hypothesis states:

H2: digital competence has a positive and significant effect on employee engagement.

The e-government policy is essentially designed to improve the quality of service and employee performance. Studies on regional government agencies show that system quality and the use of work applications can increase satisfaction and productivity/performance, although the impact is not always uniform across regions and organizations [33], [42], [45]. This raises the important question of whether e-government actually directly drives Civil Servants Individual Performance. Therefore, a third hypothesis is proposed:

H3: e-government implementation has a positive and significant effect on the civil servants individual performance.

On the other hand, the digital competence factor is clearly closely related to employees' technical abilities in completing daily tasks. Apparatus who are proficient in operating applications, managing data, and overcoming technical problems have a greater chance of completing work on time and with quality results. Indonesian and international evidence supports this positive relationship [10], [41], [43]. Therefore, the fourth hypothesis is formulated:

H4: digital competence has a positive and significant effect on the civil servants individual performance.

Furthermore, the literature emphasizes that employee engagement is an important psychological channel that influences performance. Conceptually, engagement encompasses vigor, dedication, and absorption [13]; and quantitative evidence suggests that engagement is positively correlated with task and contextual performance [15], [16], [40]. Based on this, this study proposes the fifth hypothesis:

H5: Employee engagement has a positive and significant effect on the civil servants individual performance.

The literature also shows that organizational and technological factors often do not directly impact performance, but rather through psychological variables such as engagement. Indonesian evidence in the public sector found a mediating role for engagement between organizational support/justice and work outcomes [39], while contemporary mediation approaches suggest testing indirect effects to confirm this channel [30]. Based on this pattern, e-government implementation is expected to contribute to civil servants performance when engagement is built. Based on this, the sixth hypothesis is proposed:

H6: Employee engagement positively and significantly mediates the influence of e-government implementation on the civil servants individual performance.

The same applies to digital competency. Civil servants who are confident in their digital skills tend to be more energetic, dedicated, and immersed in their work; this engagement is what then links digital competency to improved performance. Empirical evidence from Indonesia and internationally supports this pattern [34], [40], [44]. Therefore, the seventh hypothesis states:

H7: Employee engagement positively and significantly mediates the influence of digital competence on the civil servants individual performance.

Conceptual Framework

Based on theoretical descriptions and previous research findings, this study develops a conceptual framework that illustrates the relationships between key variables. E-government implementation (X1) and digital competence (X2) are positioned as independent variables that influence the Civil Servants Individual Performance (Y), both directly and through the mediating role of employee engagement (Z).

Conceptually, increasingly mature e-government implementation is expected to increase employee engagement with their work, while digital competence provides confidence and ease in completing tasks, which in turn also strengthens engagement. Both are believed to contribute directly to improving Civil Servants individual performance, but this influence can be strengthened through employee engagement as a bridging psychological factor. Therefore, the conceptual framework of this study is as follows:

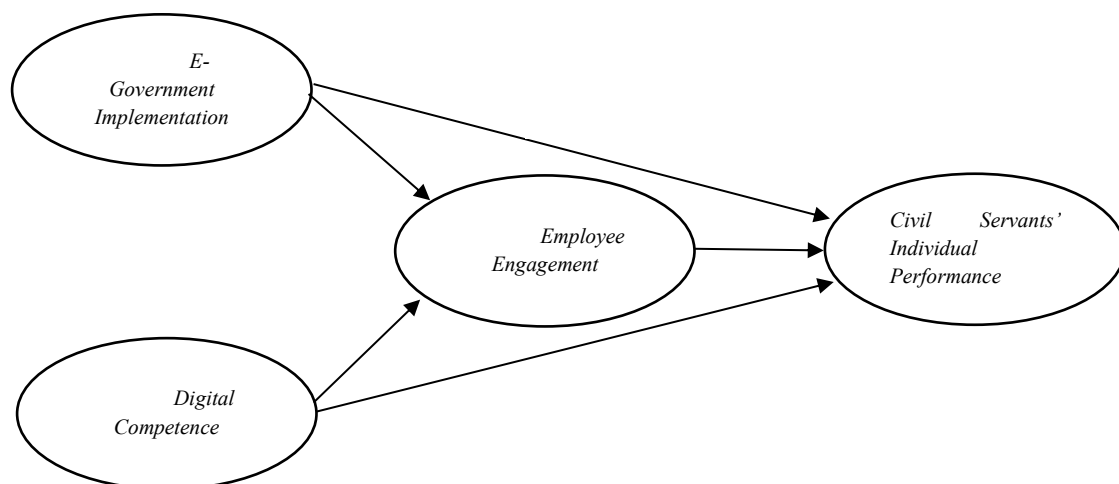


Figure 1. Conceptual Framework of the Research

2. Research Methodology

Research Design

This study uses a quantitative explanatory design to test the causal relationships between latent constructs in the context of North Luwu Regency. This design allows testing of direct and indirect (mediation) effects in a single integrated model using the Partial Least Squares–Structural Equation Modeling (PLS-SEM) approach. PLS-SEM was chosen because it is adequate for models with multiple latent constructs and indicators, is tolerant of non-normal data distributions, and is suitable for prediction purposes [25]. This design selection is based on three main considerations. First, the research model involves four latent constructs: e-government implementation, digital competence, employee engagement, and Civil Servants individual performance. These constructs cannot be measured directly and therefore need to be operationalized through indicators, which are then analyzed using the SEM method. Second, explanatory research is relevant because it not only describes phenomena but also explains the mechanisms of influence between variables. Third, quantitative data collection through a structured questionnaire allows generalization of research results to the civil servants population in North Luwu Regency.

Population and Sample

The population of this study was all civil servants working in Regional Apparatus Organizations (OPD) within the North Luwu Regency Government. Civil servants were selected because they are the primary actors in implementing the e-government policy and determine the quality of public services. Stratified proportional random sampling was used, with each OPD as a stratum, so that each work unit received a sample allocation proportional to the number of civil servants. This approach minimizes bias due to differences in OPD size and function and enhances the external validity of the findings.

In PLS-SEM, the recommended minimum sample size is 10 times the number of relationships leading to the most complex endogenous construct, or 5–10 times the number of indicators in the model, whichever is larger. [46]. With a total of 20 indicators, the minimum requirement is around 100–200 respondents. In addition, for testing mediation through bootstrapping, a larger sample size increases the precision of the confidence interval [25]. This study analyzed 267 valid respondents, which exceeds the minimum limit and is therefore sufficient for testing the model and indirect effects.

Research Instruments

The main instrument is a structured questionnaire with a Likert scale of 1–5 (1 = strongly disagree to 5 = strongly agree). Each construct is operationalized based on relevant and validated theoretical references as follows:

E-government Implementation : digitalization of key work processes, integration of cross-unit applications, availability of SOPs/training, adequacy of IT support, and dashboard-based performance monitoring. Indicators are abstracted from the national e-government framework and the principles of the Digital Government Index [3], [4].

Digital Competence : ability to operate core applications, speed of learning new features, simple data processing, digital security awareness, and technical problem-solving skills. Reference to the DigComp 2.0/2.2 framework [8], [9].

Employee Engagement : vigor, dedication, and absorption, referring to UWES-9 (a shortened version widely used across countries) [13].

Civil Servants Individual Performance : punctuality, quality of results, target achievement, SOP compliance, improvement initiatives, helpful behavior towards colleagues, and responsiveness, referring to the Individual Work Performance Questionnaire (IWPQ) [17].

To clarify the operational definition, each variable in this study is described through the dimensions, definitions, and indicators shown in Table 1 below:

Table 1. Identification of Research Variables

Variables	Definition	Indicator
E-Government Implementation (X ₁)	The level of implementation of electronic-based government systems includes digitalization of work processes, application connectivity, availability of guidance, infrastructure support, and performance monitoring [3], [4].	1) Digitalization of key work processes 2) Application integration 3) SOP/guide and digital training available 4) Adequate IT support 5) Data/dashboard based performance monitoring
Digital Competence (X ₂)	CIVIL SERVANTS's ability to operate work applications, manage information, implement digital security, and solve simple technical problems [10].	1) Ability to operate core applications 2) Speed of learning new features 3) Digital security awareness 4) Simple data processing 5) Technical problem solving skills
Employee Engagement (Z)	Employee engagement with their work is reflected in vigor, dedication, and absorption [13], [38].	1) Vigor 2) Dedication 3) Absorption
Civil Servants Individual Performance (Y)	The level of employee work results achieved according to targets, quality standards and timeliness by complying with organizational rules [39].	1) Punctuality 2) Quality of results 3) Target achievement 4) Compliance with SOPs 5) Improvement initiatives 6) Helping colleagues 7) Responsive

Source : The concept developed in this research, 2025

Data Collection Techniques

Primary data was collected through an online survey using Google Forms, distributed through official OPD communication channels. The online format was chosen because it was more efficient in reaching respondents, aligned with the spirit of bureaucratic digitization, and minimized manual input errors.

Data collection took place over four weeks, with periodic reminders to increase response rates. Respondents were given an explanation of the research objectives, guaranteed confidentiality, and the voluntary nature of participation. This procedure complies with the ethical principles of social research regarding informed consent [9].

In addition to primary data, this study also utilized secondary data in the form of official government documents, such as national and regional e-government index reports (2021–2024) and regulations related to e-government. This secondary data provides additional context and strengthens the interpretation of the primary data.

Data Analysis Techniques

Data were analyzed using the Partial Least Squares–Structural Equation Modeling (PLS-SEM) method using SmartPLS 3 software.

The analysis was carried out in two stages:

1. Measurement Model Evaluation (Outer Model): indicator reliability was tested through loading values (≥ 0.70). Convergent validity was assessed by AVE (≥ 0.50). Internal consistency was tested by Composite Reliability (≥ 0.70) and Cronbach's Alpha (≥ 0.70). Discriminant validity was examined through the Fornell-Larcker criteria and the HTMT ratio (< 0.90) [46].
2. Structural Model Evaluation (Inner Model): The predictive power of the constructs is tested through the R^2 value. The magnitude of the influence between variables is measured by f^2 , while the predictive relevance is evaluated by Q^2 . The significance of the path coefficients is tested using the bootstrapping technique with 5,000 resamplings at a significance level of 5%.[46]

These steps follow PLS-SEM reporting guidelines that emphasize a balance between measurement fit, inference precision, and predictive power [25], [30], [46].

3. Result and Discussion

Results

The analysis was conducted on 267 respondents of the civil servants of North Luwu Regency using SmartPLS 3. Four constructs were analyzed, namely E-Government Implementation, Digital Competenc, Employee Engagement, and Civil Servants Individual Performance. The following figure presents the results of PLS-SEM in this study:

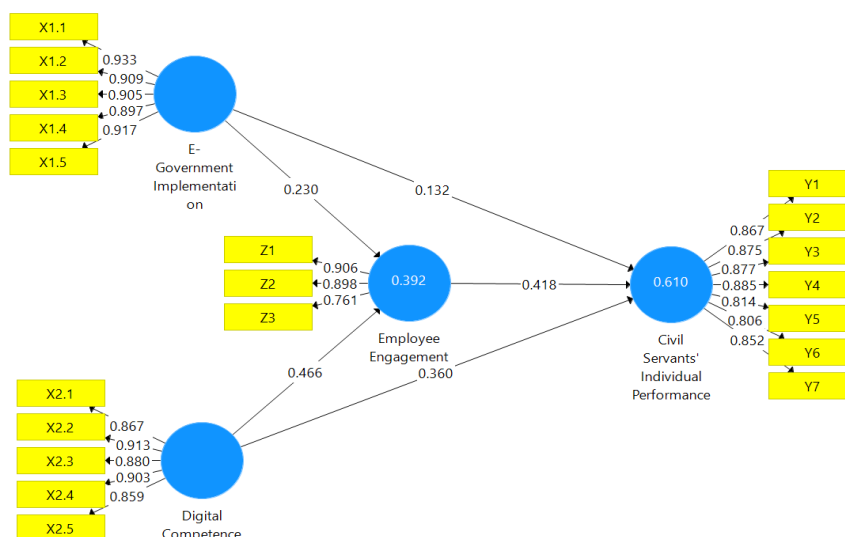


Figure 2. PLS-SEM model estimation results

Structural Model Testing (Outer Model)

The outer model evaluation was conducted in stages. First, the construct validity test, namely convergent validity, was reviewed from the loading factor of each indicator which was ≥ 0.70 and the AVE value of each construct which was ≥ 0.50 ; then discriminant validity, was ensured through cross-loading (indicator loading on the original construct $>$ loading on another construct), the Fornell–Larcker criteria ($\sqrt{\text{AVE}}$ on the diagonal is greater than the correlation between constructs), and the HTMT ratio < 0.90 . Second, construct reliability was assessed through Composite Reliability ≥ 0.70 and Cronbach's Alpha ≥ 0.70 . [46]

Construct Validity Test

In SEM-PLS, construct validity testing is carried out in two stages, namely:

1) Convergent Validity

At this stage, the quality of the indicators is assessed using two main measures:

a) Loading factors can be seen in the following table:

Tabel 2. Outer Loadings

	Civil Servants' Individual Performance	Digital Competence	E-Government Implementation	Employee Engagement
X1.1			0,93	
X1.2			3	0,90
X1.3			9	0,90
X1.4			5	0,89
X1.5			7	0,91
X2.1		0,86	7	
X2.2		7	0,91	
X2.3		3	0,88	
X2.4		0	0,90	
X2.5		3	0,85	
Y1	0,86			
Y2	7	0,87		
Y3	5	0,87		
Y4	7	0,88		
	5			

Y5	0,81		
	4		
Y6	0,80		
	6		
Y7	0,85		
	2		
Z1		0,90	
		6	
Z2		0,89	
		8	
Z3		0,76	
		1	

Source : Primary data processed, 2025

All indicators demonstrate strong measurement contributions to their constructs, with loadings ranging from 0.761 to 0.933 (all ≥ 0.70). For the E-Government Implementation construct, five indicators are consistently high (0.897 to 0.933), thus the construct variation is well represented by items X1.1–X1.5. For Digital Competence, the loading pattern (0.859–0.913) is stable and exceeds the criterion, indicating that items X2.1–X2.5 adequately represent the intended construct. For Employee Engagement, Z1 and Z2 are very high (0.90), while Z3 = 0.761 is the lowest but still reflects above the appropriateness threshold of 0.70; therefore, there is no statistical indication for elimination at this stage. Meanwhile, the Civil Servants Individual Performance construct shows a strong, even loading (0.806–0.885), strengthening the belief that the individual performance dimensions are comprehensively described by Y1–Y7.

Overall, no indicators fell below the 0.70 threshold; thus, convergent validity at the indicator level was met for all constructs.

b) The AVE value can be seen in the following table:

Table 3. AVE value

	Cronbach's Alpha	rho_A	Composite Reliability	AVE
Civil Servants' Individual Performance	0,938	0,941	0,950	0,730
Digital Competence	0,930	0,931	0,947	0,783
E-Government Implementation	0,949	0,950	0,961	0,832
Employee Engagement	0,818	0,838	0,892	0,735

Source : Primary data processed, 2025

Based on the table above, the four constructs meet convergent validity with a minimum AVE threshold of 0.50. The AVE value for E-Government Implementation was recorded at 0.832, Digital Competence at 0.783, Employee Engagement at 0.735, and Civil Servants' Individual Performance at 0.730. Thus, each construct explains more than half of the variance of its indicators, so the indicators in each construct are considered adequate in representing the concepts being measured.

2) Discriminant Validity

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This stage assesses the discriminability of constructs through two complementary approaches, the first examining cross-loadings to ensure that the loading of indicators on the original construct is always greater than the loading on other constructs and the second assessing the correlation between latent constructs. Thus, indicators remain attached to the appropriate constructs, while each construct remains empirically separate.[46]

a) The cross loading values can be seen in the following table:

Table 4. Cross Loading

	Civil Servants' Individual Performance	Digital Competence	E-Government Implementation	Employee Engagement
X1.1	0,498	0,507	0,933	0,433
X1.2	0,500	0,462	0,909	0,464
X1.3	0,508	0,560	0,905	0,452
X1.4	0,469	0,511	0,897	0,474
X1.5	0,500	0,548	0,917	0,430
X2.1	0,612	0,867	0,488	0,516
X2.2	0,617	0,913	0,522	0,547
X2.3	0,624	0,880	0,481	0,528
X2.4	0,604	0,903	0,497	0,549
X2.5	0,569	0,859	0,524	0,498
Y1	0,867	0,603	0,517	0,593
Y2	0,875	0,601	0,551	0,640
Y3	0,877	0,596	0,500	0,653
Y4	0,885	0,606	0,488	0,605
Y5	0,814	0,553	0,447	0,561
Y6	0,806	0,552	0,323	0,507
Y7	0,852	0,578	0,393	0,600
Z1	0,629	0,531	0,452	0,906
Z2	0,679	0,551	0,403	0,898
Z3	0,467	0,445	0,424	0,761

Source : Primary data processed, 2025

Based on the cross loading table above, each indicator loads most strongly on its original construct so that it meets the requirements for discriminant validity.

In the E-Government Implementation construct, five indicators showed loadings on the original construct in the range of 0.897 to 0.933. The loadings of the same indicators on other constructs ranged from 0.433 to 0.560.

For the Digital Competence construct, indicator loadings ranged from 0.859 to 0.913. Loadings for other constructs were generally lower, ranging from 0.497 to 0.624. The difference between the primary loading and the highest loading on other constructs remained clear, indicating that indicators X2.1 to X2.5 represent this construct well.

For the civil servants individual performance construct, indicator loadings range from 0.806 to 0.885. the same indicator loadings for other constructs range from 0.553 to 0.653. The

most stringent example is seen in indicator Y3, but the loading on the original construct is still greater than the loadings on the other constructs.

For the Employee Engagement construct, indicator loadings ranged from 0.761 to 0.906. The highest loadings for other constructs were around 0.679. Indicator Z2 had the smallest gap, but the difference was still sufficient to support construct differentiation.

Overall, all indicators more strongly represent their own constructs than other constructs. Therefore, the cross-loading results support the conclusion that the measurement model meets discriminant validity and can be continued with further testing.

b) The correlation between latent constructs can be seen in the following table:

Tabel 4. Latent Variabel Correlations

	Civil Servants' Individual Performance	Digital Competence	E-Government Implementation	Employee Engagement
Civil Servants' Individual Performance	1,000	0,684	0,543	0,698
Digital Competence	0,684	1,000	0,567	0,597
E-Government Implementation	0,543	0,567	1,000	0,494
Employee Engagement	0,698	0,597	0,494	1,000

Source : Primary data processed, 2025

Based on the correlation table between latent constructs in Table 4, the relationship between constructs is at a moderate to strong level. Civil Servants Individual Performance has a fairly strong correlation with Employee Engagement of 0.698 and with Digital Competence of 0.684, while the correlation with E-Government Implementation is 0.543. Digital Competence is moderately correlated with E-Government Implementation of 0.567 and with Employee Engagement of 0.597. The pair with the smallest value is E-Government Implementation and Employee Engagement at 0.494, which is still classified as a moderate correlation.

As an additional examination, all correlation coefficients are below the square root of the AVE of each construct, which is around 0.854 for Civil Servants Individual Performance, 0.885 for Digital Competence, 0.912 for E-Government Implementation, and 0.857 for Employee Engagement. Thus, these results support the fulfillment of discriminant validity according to the Fornell–Larcker criteria, while showing that although the constructs are interrelated, each still has a clear distinction.

Reliability Test

This section presents reliability testing of the measurement model. Internal consistency was evaluated using Composite Reliability (CR) and Cronbach's Alpha. In PLS-SEM, CR is generally prioritized, while Alpha is seen as a lower limit of reliability. A value considered adequate is usually at least 0.70 [46]. A summary of the results is presented in the following table:

Table 5. Reliability Test

	Cronbach's Alpha	rho_A	Composite Reliability	AVE
Civil Servants' Individual Performance	0,938	0,941	0,950	0,730
Digital Competence	0,930	0,931	0,947	0,783
E-Government Implementation	0,949	0,950	0,961	0,832
Employee Engagement	0,818	0,838	0,892	0,735

Source : Primary data processed, 2025

Based on the table, all constructs show good internal consistency because the CR and Cronbach's Alpha values are above the minimum threshold.

E-Government Implementation has a Composite Reliability of 0.961 and a Cronbach's Alpha of 0.949. These values indicate very strong reliability. Digital Competence shows a Composite Reliability of 0.947 and a Cronbach's Alpha of 0.930. These results confirm the stability of the measurement and the consistency of respondents' answers across all construct indicators. Civil Servants' Individual Performance shows a Composite Reliability of 0.950 and a Cronbach's Alpha of 0.938, indicating very good reliability and supporting the use of all indicators in this construct. Employee Engagement has a Composite Reliability of 0.892 and a Cronbach's Alpha of 0.818. Although relatively the lowest among the other constructs, its value still exceeds the minimum criteria and is still categorized as reliable.

Overall, all four constructs were reliable. This confirms that the indicators within each construct operate consistently, confirming the appropriateness of the measurement model and allowing the analysis to proceed to the structural model (Inner Model) testing stage.

Structural Model Testing (Inner Model)

The following steps evaluate the inner model using two main criteria: R-Square for the model's explanatory power and path significance for assessing the meaningfulness of the effects. The following figure presents the network of relationships between constructs along with the test statistics generated from the bootstrapping process.

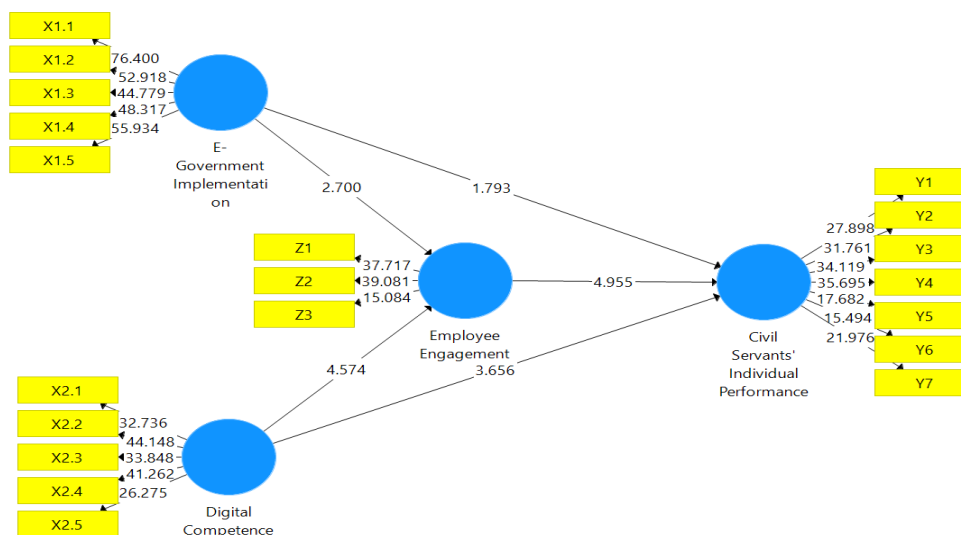


Figure 3. Path Diagram of Hypothesis Test Results

R-Square Value

The R-Square indicates how much of the variation in the endogenous construct can be explained by the predictor constructs in the inner model; in practice, a value of around 0.75 is considered strong, around 0.50 moderate, and around 0.25 weak. This information serves as the basis for assessing the model's explanatory power before proceeding to path significance testing. The R-Square values are presented in the following table:

Table 6. R-Square Value

	R Square
Civil Servants' Individual Performance	0,610
Employee Engagement	0,392

Source : Primary data processed, 2025

Based on the table, Civil Servants Individual Performance falls into the moderate category because approximately 61% of its variation can be explained by the predictor constructs in the model. Employee Engagement also falls into the moderate category, but with lower explanatory power, at approximately 39%.

Path Coefficients

The following table presents the path coefficients from the PLS-SEM estimation results along with their significance tests using the bootstrapping procedure.

Tabel 7. Path Coefficients

	Original (O)	Sample T (O/STDEV)	P Values
Digital Competence -> Civil Servants' Individual Performance	0,360	3,656	0,000
Digital Competence -> Employee Engagement	0,466	4,574	0,000
E-Government Implementation -> Civil Servants' Individual Performance	0,132	1,793	0,074
E-Government Implementation -> Employee Engagement	0,230	2,700	0,007
Employee Engagement -> Civil Servants' Individual Performance	0,418	4,955	0,000

Source : Primary data processed, 2025

Based on the table, Digital Competence has been proven to have a positive and significant effect on Civil Servants Individual Performance. This is evident from the coefficient of 0.360, a significance value of 0.000 which is below the five percent alpha level, and a t-statistic value of 3.656 which exceeds the t-table of 1.969. Digital Competence also has a positive and significant effect on Employee Engagement with a coefficient of 0.466, a significance value of 0.000 below 0.05, and a t-statistic value of 4.574 which is greater than 1.969 (t-table).

Furthermore, E-Government Implementation has a positive and significant impact on Employee Engagement. The path coefficient is 0.230, with a significance value of 0.007 below 0.05 and a t-statistic value of 2.700 exceeding 1.969 (t-table). However, the direct effect of E-Government Implementation on Civil Servants Individual Performance does not meet the significance criteria at the five percent level; the coefficient is 0.132, the significance value of 0.074 is greater than 0.05, and the t-statistic value of 1.793 is still below 1.969 (t-table).

Finally, Employee Engagement has a positive and significant effect on Civil Servants Individual Performance with a coefficient of 0.418, a significance value of 0.000 below 0.05, and a t-statistic of 4.955, which is greater than 1.96 (t-table). Overall, these findings indicate that improving individual performance primarily occurs through strengthening employee engagement. Digital competence works directly through engagement, while e-government implementation only has a real impact on performance when employee engagement is first enhanced.

Indirect Effect

Table 8. Indirect Effect

	Original Sample (O)	T Statistics (O/STDEV)	P Values
Digital Competence -> Civil Servants' Individual Performance	0,195	2,775	0,006
E-Government Implementation -> Civil Servants' Individual Performance	0,096	2,582	0,010

Source : Primary data processed, 2025

Based on the bootstrapping results, the indirect effect through Employee Engagement proved significant. Digital Competence affects Civil Servants Individual Performance through Employee Engagement with an indirect effect size of 0.195, a t-value of 2.775 that exceeds the t-table of approximately 1.97, and a significance value of 0.006 that is smaller than 0.05. E-Government Implementation also affects Civil Servants Individual Performance through Employee Engagement with an indirect effect of 0.096, a t-value of 2.582 that is greater than 1.97, and a significance value of 0.010 that is below 0.05. These findings confirm that Employee Engagement acts as a valid mediator in both relationships. Substantively, some of the influence of Digital Competence on performance flows through engagement, while in E-Government Implementation the contribution to performance is primarily channeled through engagement because the direct path does not reach statistical significance.

Discussion

The most prominent pattern in the model is the role of employee engagement as a strong psychological channel to individual performance. The path from Digital Competence to performance is significant with a medium effect size, while the direct path from the E-Government Implementation to performance is positive but has not yet reached significance at the five percent level. This pattern is consistent with the Job Demands and Resources (JD-R) framework: job resources (e.g., clear work systems, technical support) and personal resources
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(e.g., digital competence) first strengthen engagement, which then results in performance [14], [15], [16]. The increase in the EBS Index in North Luwu Regency in 2021–2023 [22], [23], [24] is reasonable if it is first reflected in improvements in the daily work experience; as flows, information, and support become more organized, engagement increases, and the impact on performance becomes more stable.

H1. E-Government Implementation on Employee Engagement

The path coefficient from e-government to engagement is $\beta = 0.230$ with $p = 0.007$, indicating that e-government implementation has a positive and significant effect on employee engagement. This means that when e-government is perceived as helpful, for example, processes are clearer, information is more accessible, and technical assistance is provided on time, civil servants tend to feel more energized, dedicated, and immersed in their work. In JD-R language, e-government provides job resources that reduce barriers, increase the sense of control, and give meaning to tasks [14]. This finding is in line with e-government studies that link system and procedure improvements with adaptive work behavior [1], [2] and with studies of Indonesian civil servants that place organizational support and system quality as drivers of engagement [38], [39]. In the North Luwu OPD, the implications are streamlining flows, unifying interrelated applications, and maintaining helpdesk responsiveness during service hours.

H2. Digital Competence on Employee Engagement

The path from Digital Competence to engagement of $\beta = 0.466$ with $p < 0.001$ indicates that digital competence has a positive and significant effect on employee engagement, with a greater effect strength than the H1 path. Digital competence provides a sense of capability and autonomy in dealing with application- and data-based demands. In the JD-R framework, this is a personal resource that triggers engagement [14], [36]. This finding is consistent with the DigComp framework [8], [9] and empirical evidence linking employee digital capabilities to service quality and energized work behavior [10], [41]. In North Luwu, training embedded in local e-government tasks (rather than general material) has the potential to strengthen engagement most quickly.

H3. Implementation of e-government on Civil Servants Individual Performance

The direct path of e-government to performance is $\beta = 0.132$ with $p = 0.0735$. Thus, e-government implementation has a positive but insignificant effect on civil servants individual performance at the five percent level. This condition is common in organizations that are consolidating platforms, standardizing SOPs, and increasing digital literacy. The e-government literature shows that system benefits often work through improvements in work processes and behaviors before being seen as increases in individual performance [18], [19]. Evidence in Indonesian local governments also emphasizes process and organizational readiness as prerequisites for e-government outputs [31], [45]. In North Luwu, strengthening the direct effect of e-government on performance requires consistency of SOPs across OPDs, interoperability of core applications, and performance feedback that is easily understood by all units.

H4. Digital Competence on Civil Servants Individual Performance

The path from Digital Competence to performance has a value of $\beta = 0.360$ with $p = 0.000283$. This indicates that digital competence has a positive and significant effect on civil

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servants individual performance, with a medium effect size. Operationally, the ability to operate core applications, process simple data, maintain information security, and overcome daily technical obstacles reduces work cycle time and reduces errors. This finding is in line with studies linking employee digital competence with productivity and service quality [10], [41], [43]. The implication for North Luwu is to focus on improving competencies that are most closely related to local government applications, such as electronic document management, disposition tracking, service recording, simple analytics, and account security practices.

H5. Employee Engagement on Civil Servants Individual Performance

The results show that employee engagement has a positive and significant effect on civil servants individual performance ($\beta = 0.418$; $p < 0.001$) and is the strongest path in the model. Psychologically, engagement—which includes energy, dedication, and absorption—increases the intensity, persistence, and quality of task execution. Meta-analysis and cross-context validation support this relationship on both task performance and contextual performance [12], [15], [16], [40]. For North Luwu, these results strengthen the rationale for including engagement indicators as early markers in the OPD performance management cycle, for example through a concise UWES module on the evaluation dashboard.

H6. Mediation of Attachment in the Relationship between e-government and Performance

The indirect effect of e-government on performance through engagement is $\beta = 0.096$ with $p = 0.0101$. In other words, employee engagement positively and significantly mediates the effect of e-government implementation on Civil Servants individual performance. The mechanism is plausible: a more streamlined system reduces friction, clarifies expectations, and provides rapid feedback; the work experience improves, engagement increases, and work outcomes follow. Modern mediation approaches emphasize indirect effects as evidence of a working mechanism [30], and service literature shows that organizational resources improve performance through service climate and employee engagement [35], [38]. For North Luwu, the e-government module should include friendly user experience principles, short, task-relevant training, and rapid dashboard-based feedback.

H7. Mediation of Engagement in the Relationship between Digital Competence and Performance

The indirect effect of digital competence on performance through engagement is $\beta = 0.195$ with $p = 0.0057$. Thus, employee engagement positively and significantly mediates the influence of digital competence on Civil Servants individual performance, in addition to the direct path that is also significant. In the JD-R framework, digital competence represents personal resources. Sequentially, personal resources influence engagement which then influences performance. Classical and recent evidence supports this chain of influence [36], [37], [40], and in the context of Indonesian civil servants, self-efficacy is also noted to be related to engagement [34]. For North Luwu, training that not only transfers technical knowledge, but also builds efficacy through gradual practice, feedback that values efforts, and communities of practice across OPDs will strengthen this pathway.

4. Conclusion

This study assesses the role of the e-government implementation and digital competence on the individual performance of civil servants in North Luwu Regency, with employee

engagement as a mediating variable. Using PLS-SEM on 267 respondents, the model demonstrated good explanatory power for engagement and performance.

The main results confirm that the implementation of e-government has a positive and significant effect on engagement; clarity of workflow, rapid access to information, and technical support related to e-government are correlated with increased energy, dedication, and involvement of civil servants. Digital competence also has a positive and significant effect on engagement, with a stronger effect than e-government. On performance, the direct effect of e-government is positive but not significant at the 5% level, indicating its benefits come first through improved work experience and increased engagement. Conversely, digital competence has a positive and significant effect on performance; technical proficiency accelerates task completion, reduces errors, and improves the quality of results. Engagement itself has a positive and significant effect on performance and is the strongest influence pathway in the model. Furthermore, engagement positively and significantly mediates the effects of both e-government and digital competence on performance.

These findings suggest that a combination of contextually strengthening digital competencies in government applications and improving the e-government implementation at the point of daily work is the most consistent strategy for improving individual civil servant performance. Policy priorities include task-based training, streamlining and integrating workflows/applications, responsive technical support, and incorporating engagement indicators into the performance evaluation cycle. Further research is recommended to expand service units, conduct cross-district comparisons, and incorporate public service outcome indicators to more directly measure the impact on citizens.

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