

## DIGITAL GOVERNANCE AS A CONDITIONAL ANTI-FRAUD MECHANISM: THE INTERACTIVE EFFECTS OF ELECTRONIC PROCUREMENT, ELECTRONIC GOVERNMENT, AND BERAKHLAK ORGANIZATIONAL CULTURE

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### Abstract

Fraud in public procurement remains a persistent governance problem despite the widespread implementation of digital systems in the public sector. Although prior studies confirm that e-procurement and e-government enhance transparency, empirical evidence integrating digital governance and organizational culture in explaining fraud detection effectiveness remains limited, particularly at the ministerial level in developing countries. This study aims to examine the impact of e-procurement and e-government on fraud detection and to analyze the moderating role of BerAKHLAK organizational culture within the Indonesian Ministry of Immigration and Corrections. This research employs a quantitative approach using survey data collected from 320 procurement and budget officials across 33 provinces in 2024-2025. Data were analyzed using Structural Equation Modeling-Partial Least Squares (SEM-PLS) to evaluate both direct and moderating effects. The results indicate that e-procurement ( $\beta=0,451$ ;  $p<0,001$ ) and e-government ( $\beta=0,357$ ;  $p<0,001$ ) have positive and significant effects on fraud detection. Furthermore, BerAKHLAK organizational culture significantly strengthens the influence of both e-procurement ( $\beta = 0,307$ ,  $p<0,001$ ) and e-government ( $\beta = 0,315$ ,  $p < 0,001$ ). The structural model explains 63,6% of the variance in fraud detection, demonstrating substantial explanatory power. This study offers novelty by developing an integrated moderated model that positions organizational culture as a contextual enhancer of digital fraud control mechanisms. The findings extend Agency Theory, the Theory of Planned Behavior, and fraud hexagon theory within a digital governance context. Practically, the results highlight that technological sophistication alone is insufficient; effective fraud detection requires the simultaneous strengthening of ethical organizational values to ensure sustainable and accountable public governance.

**Keywords:** Akhlak Organizational Culture, E-Procurement, E-Government, Fraud Detection, Public Sector Governance.



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## INTRODUCTION

Fraud is a global problem that systematically weakens public sector governance, reduces budget management efficiency, and erodes public trust in state institutions. The economic losses resulting from fraud and corruption in the public sector are reported to reach hundreds of billions of dollars each year, particularly in the procurement of goods and services, which is characterized by high discretion, procedural complexity, and information asymmetry (KPK, 2025). This condition makes public procurement the most vulnerable point in the government financial management cycle (N. I. Khan et al., 2022; Mansyuri & Ramadhan, 2024a).

Various theories of “fraud,” ranging from the fraud triangle, fraud diamond, to fraud hexagon, emphasize that fraud is not solely triggered by pressure and opportunity, but also by rationalization, individual capabilities, and weak organizational values and ethics (Vousinas, 2019; Yusrianti et al., 2020; Susetyo et al., 2024). Therefore, modern prevention approaches no longer rely solely on law enforcement and administrative controls, but require the integration of internal controls, digital transparency, and the strengthening of an organizational culture of integrity.

In the Indonesian context, corruption and fraud in the public sector remain chronic problems despite various governance reforms that have been implemented (Khan et al., 2022; Lyra et al., 2022). Data from the Corruption Eradication Commission shows that ministries, institutions, and local governments are consistently involved in corruption cases with a recurring trend from year to year (KPK, 2025). This fact indicates that the existence of a formal oversight system has not been fully effective in curbing fraudulent practices on an ongoing basis.

In particular, the procurement of goods and services ranks as the sector with the highest risk (Mulabdic & Rotunno, 2022; Hardinata & Hardinata, 2024; Mansyuri & Ramadhan, 2024a; Ferina et al., 2025). The facts on the ground are that e-procurement still faces many obstacles in its implementation in central and regional governments (Safitri et al., 2025). Procurement cases are among the most common types of corruption after gratification/bribery, reflecting the high potential for tender collusion, price mark-ups, specification manipulation, and project winner rigging (Caserta et al., 2022; Okafor et al., 2020; Vian, 2020). The impact is not only fiscal losses, but also a decline in the quality of public services that is directly felt by the community (Ratmono et al., 2021).

Various conventional instruments such as COSO internal controls, risk-based internal audits, auditor training, and whistleblowing systems have been widely implemented and proven to assist in fraud detection (Awang et al., 2020; Yusrianti et al., 2020; Wei et al., 2021; Harahap & Erlina, 2024; Myeza et al., 2021; Paranoan et al., 2024). However, empirical findings show that their effectiveness is still partial and varies, especially in dealing with collusive and organized procurement corruption (Khan et al., 2021; Pham, 2023; Mushi, 2024). This indicates a gap between the design of the control system and its actual effectiveness at the implementation level.

In response, the government is promoting digitization through the implementation of e-procurement to improve transparency, accountability, and transaction audit trails (Ciesielska et al., 2022; Hidayati et al., 2024; Latupeirissa et al., 2024; Majeed et al., 2024). Various international and domestic studies show that e-procurement can reduce direct interaction, narrow opportunities for collusion, and strengthen data-based oversight (Sukmadilaga et al., 2022). However, a number of studies also highlight that its success is highly dependent on infrastructure readiness, human resource competence, and organizational integrity (Wu et al., 2020; Orazgaliyeva et al., 2023).

Broader digital transformation through e-government has also strengthened the oversight system by providing data integration, real-time tracking, and improved access to public information (Adam, 2020; Ali et al., 2021; Zhao et al., 2021). Indonesia's improved ranking on the E-Government Development Index shows significant progress in the digitization of public administration (Prakasa et al., 2023; United Nations Department of Economic and Social Affairs, 2024). However, the high number of corruption cases shows that technological maturity does not automatically correlate with the effectiveness of fraud detection (Mansyuri & Ramadhan, 2024b).

Recent literature emphasizes that digital technology does not operate in a vacuum, but is influenced by behavioral and organizational cultural factors (Jiménez et al., 2022; Khan et al., 2022; Junus et al., 2023). Ethical culture, integrity, and commitment to values have been shown to strengthen the effectiveness of digital systems, while a permissive culture opens the door to manipulation (Ferina et al., 2021; Maulidi, 2022; Safkaur et al., 2025). Thus, organizational culture is seen as a key moderating factor

in determining whether e-procurement and e-government are truly capable of preventing and detecting fraud.

In Indonesia, the internalization of the core values of the State Civil Apparatus (ASN) “BerAKHLAK” is designed to build an accountable, professional, adaptive, and service-oriented bureaucracy (Suryana & Briando, 2022; Brumadyadisty, 2025; Hendrich et al., 2025). Conceptually, these values have the potential to strengthen the effectiveness of digital control. However, empirical evidence on how the BerAKHLAK culture interacts with e-procurement and e-government systems in improving fraud detection is still limited and inconsistent. This gap is even more relevant in ministries with high procurement intensity, such as the Ministry of Immigration and Corrections, which manage large budgets and face various cases of procurement irregularities, particularly in correctional institutions.

The rapid development of digital governance reforms has been widely promoted as a structural solution to procurement corruption and fraud (Gong & Zhou, 2015; Kanwal & Siddique, 2022; Yang et al., 2024). However, the dominant literature remains theoretically fragmented and empirically incomplete. Most previous studies treat e-procurement and e-government as administrative innovations that improve transparency, efficiency, or corruption perceptions (Adam, 2020; Khan et al., 2021), but rarely consider fraud detection capabilities as a key organizational outcome. Consequently, the explanatory relationship between digital systems and fraud control mechanisms remains conceptually underdeveloped.

From an Agency Theory perspective, digital systems are expected to reduce information asymmetry and opportunistic behavior by strengthening monitoring and traceability (Zuo & Lin, 2022; Caserta et al., 2022; Button et al., 2023; Stanić, 2023; Guo et al., 2024). However, even though procurement systems are digital and technologically sophisticated and mature, fraud still occurs (Iswanto et al., 2022; Putra et al., 2022). In other words, digital transparency does not automatically result in fraud detection without the support of strong internal governance, but this aspect is still rarely explained in existing theoretical models. Within the Fraud Hexagon Theory framework, digital systems primarily limit the opportunities for fraud (Basiruddin et al., 2023; Cao et al., 2024; Mutemi & Bação, 2024; du Preez et al., 2025). However, fraud is multidimensional and is also influenced by rationalization, capability, collusion, ego, and pressure (Susetyo et al., 2024). However, most empirical models have not integrated these behavioral factors with digital governance in a single, integrated framework. Consequently, the relationship between formal technological controls and informal ethical controls remains underexplored.

This study addresses this gap by developing a moderated, integrated model that positions fraud detection as the primary dependent construct and examines how a BerAKHLAK organizational culture strengthens the effectiveness of e-procurement and e-government. Its novelty lies in reconceptualizing digital governance as a formal agency control mechanism whose effectiveness depends on an ethical organizational culture that suppresses the behavioral drivers identified in the Fraud Hexagon. By integrating technological and socio-organizational controls within a single structural model, this study advances a more comprehensive explanation of fraud detection in high-stakes public procurement environments.

Based on these conditions, the main issue of this study is the lack of clarity on how the integration of digital systems (e-procurement and e-government) and the BerAKHLAK organizational culture simultaneously affect the effectiveness of fraud detection in the public sector. This study offers novelty through the development of a model of BerAKHLAK organizational culture interaction as a moderating variable in the relationship between procurement digitization and fraud detection. This model is expected to contribute theoretically to the public sector accounting literature as well as provide practical recommendations for the formulation of more contextual, holistic, and sustainable anti-fraud strategies in the Indonesian government ministry environment.

Although the literature has generally proven that e-procurement and e-government increase transparency and reduce opportunities for corruption, and other studies emphasize the importance of internal controls and organizational culture in fraud prevention, these studies tend to examine these factors separately and partially. To date, there is still very limited empirical evidence explaining how the simultaneous interaction between government digital systems and organizational culture BerAKHLAK contextually affects the effectiveness of fraud detection at the ministerial level, which has a high level of procurement complexity. As a result, the causal relationship between digitization, organizational behavior, and successful fraud detection remains unintegrated, making it impossible to explain why fraud cases continue to recur even though electronic systems have been widely implemented. The absence of an integrated model creates a significant theoretical and practical gap, as policymakers do not yet have a comprehensive framework to ensure that technology investments actually result in effective fraud control.

Therefore, research is needed to holistically examine the role of the interaction between e-procurement, e-government, and BerAKHLAK organizational culture in improving fraud detection, in order to bridge the gap between digital system design and actual control performance in Indonesia's public sector.

Based on the description of the relationship between these variables, the research hypotheses are formulated as follows:

H1: E-procurement has a positive effect on fraud detection.

H2: E-government has a positive effect on fraud detection.

H3: AKHLAK organizational culture can moderate the relationship between e-procurement and fraud detection.

H4: AKHLAK organizational culture can moderate the relationship between e-government and fraud detection. The above hypothesis can be illustrated in the following conceptual model:

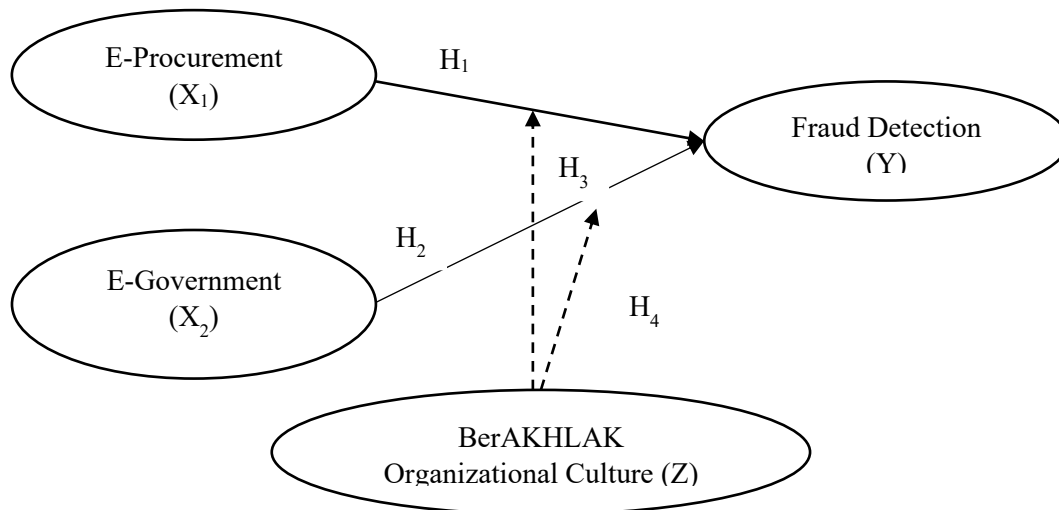


Figure 1. Conceptual model

This research is expected to contribute to the development of public sector accounting and public sector auditing because it examines the role of fraud detection in the public sector by incorporating digital technology (e-government and e-procurement) as an independent variable, as well as opening up space for the development of an integrative model that combines aspects of technology, governance, and ethical behavior in organizations. In addition, this research is expected to support the argument that the digitization of public services can reduce human intervention and increase public trust in the procurement process. This research also contributes to strengthening the Theory of Planned Behavior (TPB) Ajzen, (1991) that an ethical organizational culture can strengthen the influence of e-procurement and e-government on fraud detection prevention, helping to validate the assumption that internal organizational values play an important role in the effectiveness of digital policies. This research was conducted in Indonesia, a developing country with high bureaucratic complexity and significant corruption risks, and is expected to enrich international literature with contextual data that differs from that of developed countries. This is important for developing theories that are not only based on the context of developed countries but are also globally relevant.

**RESEARCH METHOD**

This research is a quantitative study that uses four main stages to complete the research: the first stage identifies the description of the problem phenomenon, a theoretical review, and an empirical review. Then, the research questions and objectives are defined, followed by the identification of research variables and the research model used. The second stage is data collection, which involves collecting primary data. Primary data were obtained by distributing questionnaires to respondents who were civil servants (ASN) directly involved in the procurement of goods/services at the Indonesian Ministry of Immigration and Correctional Institutions in 2024-2025. The third stage is data processing and analysis, using Structural Equation Model-Partial Least Squares (SEM-PLS) analysis to test the hypotheses proposed in this study. SEM-PLS calculations reveal a direct effect of e-procurement and e-government variables on fraud detection and organizational culture (AKHLAK) as moderating variables. The fourth

stage is analysis and conclusion, explaining the statistical results of the research using SEM-PLS from the predetermined model and then drawing conclusions.

Primary data were obtained directly from the field through questionnaires (Paramita et al., 2021). Primary data is used because this study is a survey, where information is obtained through written questions compiled in the form of a research instrument (questionnaire). The population in this study focuses on the procurement of goods and services carried out by officials at the Indonesian Ministry of Immigration and Correctional Institutions. The population in this study consisted of 2,065 individuals, consisting of 125 Functional Procurement Officers (JFT PBJ), 907 Decision-Making Officers (PPK), and 907 Budget User Authorities (KPA). The sample in this study, referring to the Krejcie & Morgan Table, was 325 respondents. Respondents targeted by the questionnaire instrument were civil servants (ASN) at the Indonesian Ministry of Immigration and Correctional Institutions from 33 provinces in 2024-2025 with the position of Functional Procurement Officers (JFT PBJ) or Decision-Making Officers (PPK) and Budget User Authorities (KPA) who are directly involved in the procurement process. The data collection technique in this study was a survey using a questionnaire, which uses a list of questions or a structured questionnaire related to the problem being studied. A structured questionnaire was distributed via email, WhatsApp group, and personal WhatsApp to each respondent. The data measurement technique used a semantic differential scale, a scale that can be used to map attitudes, penetrate deeper layers of thought, and attempt to understand the meaning of words and individual feelings of respondents (Dilnozaxon, 2025).

The research instrument was developed based on established and validated scales from previous studies and relevant regulations. All constructs were operationalized reflectively and measured using a five-point semantic differential scale ranging from 1 (strongly disagree) to 8 (strongly agree). The instrument was adapted for the public procurement context of the Ministry of Immigration and Corrections. The research instrument can be seen in Table 1 below:

Table 1. Research Instruments

Variable	Dimension	Number of Indicators	Source	Scale
E-Procurement (X <sub>1</sub> )	Fraud prevention features; transparency mechanisms	10	Khan et al., (2022)	1-8
E-Government (X <sub>2</sub> )	Digital implementation; transparency; accountability	3	Alam et al., (2023)	1-8
Fraud Detection (Y)	Detection capability; early identification; reporting effectiveness	5	Arum & Wahyudi, (2021)	1-8
BerAKHLAK Organizational Culture (M)	Service orientation, accountability, competence, harmony, loyalty, adaptability, collaboration	7	PermenPANRB No. 20/2020	1-8

The analysis technique used was Structural Equation Modeling–Partial Least Squares (SEM-PLS) with SmartPLS 4 to simultaneously test the measurement and structural models. SEM-PLS was chosen because of its suitability for predictive modeling, complex moderation analysis, and its robustness in handling non-normal data distributions and moderate sample sizes. The analysis was conducted using Measurement Model Evaluation (Outer Model), ensuring construct validity and reliability through Convergent Validity, evaluated using outer loadings (>0,70) and Average Variance Extracted (AVE>0,50). Internal Consistency Reliability was assessed using Cronbach's Alpha and Composite Reliability (CR>0,70). Discriminant Validity: examined using the Heterotrait-Monotrait Ratio (HTMT <0,85) and the Fornell-Larcker Criterion. Next, the Structural Model Evaluation (Internal Model) was measured. After ensuring measurement adequacy, the structural model was evaluated through collinearity assessment.

The Variance Inflation Factor ( $VIF < 5$ ) to avoid multicollinearity bias, the Coefficient of Determination ( $R^2$ ), and the Effect Size ( $f^2$ ) were used. Hypothesis testing was then conducted using bootstrapping with 5000 subsamples to obtain path coefficients, t-statistics ( $> 1,96$ ), and p-values ( $< 0,05$ ). Finally, a moderation analysis was conducted to test the moderating effect of the BerAKHLAK organizational culture. A significant positive interaction term indicates that organizational culture strengthens the relationship between digital governance systems and fraud detection capabilities.

## RESULTS AND DISCUSSION

### Measurement Model Analysis (Outer Model)

The measurement model was evaluated using validity and reliability criteria as outlined in the data analysis procedure.

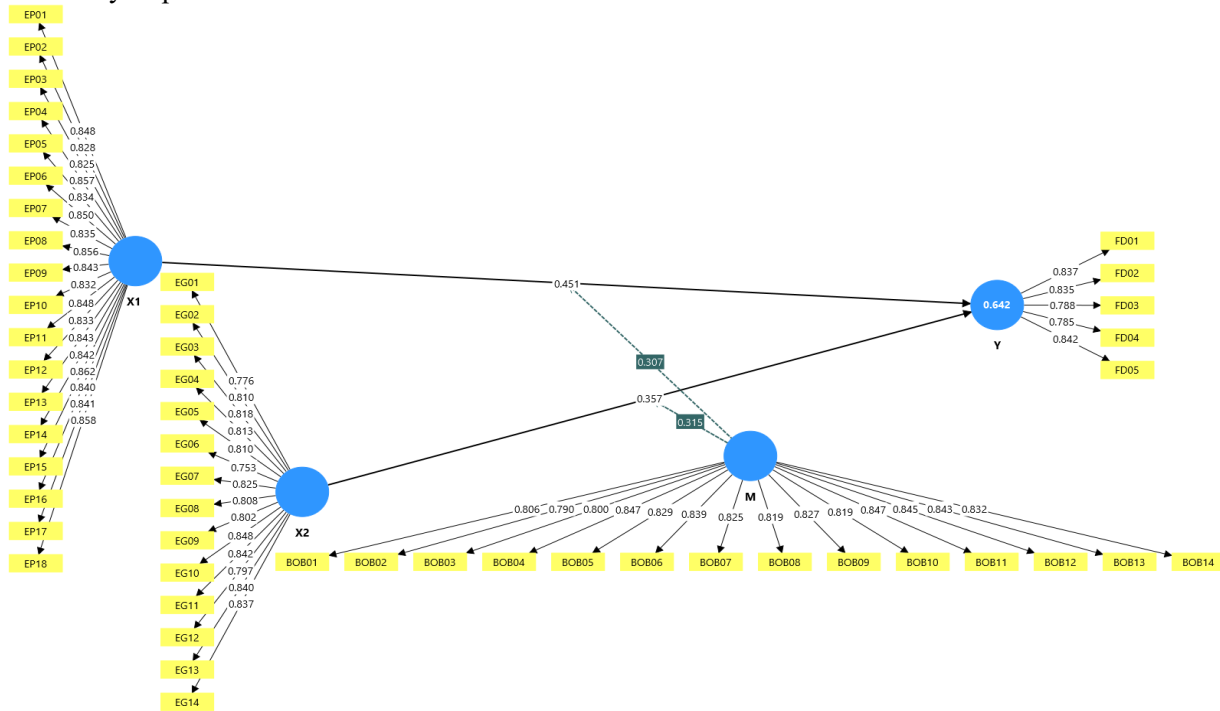


Figure 2. Outer Model Result

Based on Figure 2 above, it can be seen that the overall loading factor value of the indicators is greater than 0,7 ( $> 0,7$ ), which means that all indicators are valid and reliable in determining the construct/variable. In addition to looking at the outer loading value, convergent validity can be measured by looking at the Average Variance Extracted (AVE) value. The rule of thumb for the AVE value is  $\geq 0,5$ . The AVE values for each indicator used in this study are described in Table 2.

Table 2. Average variance extracted (AVE) Results Test

Variabel	AVE	Result
BerAKHKLAK		Valid
Organizational Culture (M)	0,683	Valid
E-Procurement (X <sub>1</sub> )	0,711	Valid
E-Government (X <sub>2</sub> )	0,661	Valid
Fraud Detection (Y)	0,669	Valid

Average Variance Extracted (AVE) is used to assess convergent validity in measurement models (Hair et al., 2019). Although used for convergent validity, AVE also plays a role in testing reliability. The ideal AVE value is  $\geq 0,5$ , which means that the construct can explain at least 50% of the variance of the indicator (Setiabudhi et al., 2025). Based on the Average Variance Extracted (AVE) test results presented in Table 3, all research variables have an AVE value greater than 0,50, thus meeting the convergent validity criteria.

All reflective indicators demonstrated outer loading values above 0,70, indicating satisfactory indicator reliability. Convergent validity was confirmed because all constructs achieved Average

Variance Extracted (AVE) values above the 0,50 threshold. Specifically, the AVE values were 0,711 for e-procurement, 0,661 for e-government, 0,669 for fraud detection, and 0.683 for AKHLAK organizational culture. These results indicate that each construct explains more than 50% of the variance in its indicator.

Table 3. Heterotrait-Monotrait Ratio (HTMT) Results Test

	BOB (moderation)	E-procurement (X <sub>1</sub> )	E-government (X <sub>2</sub> )	Fraud detection (Y)	M x X <sub>1</sub>	M x X <sub>2</sub>
BOB (moderation)						
E-procurement (X <sub>1</sub> )	0.089					
E-government (X <sub>2</sub> )	0.052	0.048				
Fraud Detection (Y)	0.366	0.477	0.386			
M x X <sub>1</sub>	0.139	0.071	0.039	0.371		
M x X <sub>2</sub>	0.120	0.033	0.021	0.299	0.058	

Discriminant validity was assessed using the Heterotrait-Monotrait Ratio (HTMT) and the Fornell-Larcker Criterion. All HTMT values were below 0,85, and the square root of the AVE for each construct exceeded the inter-construct correlation, confirming that each variable represents a distinct concept. Based on these results, the measurement model met the validity and reliability requirements and was suitable for structural model testing.

Table 4. Fornell-Larcker Criterion Results Test

	BOB (moderation)	E-procurement (X <sub>1</sub> )	E-government (X <sub>2</sub> )	Fraud detection (Y)
BOB (moderation)	0,827			
E-procurement (X <sub>1</sub> )	-0,081	0,843		
E-government (X <sub>2</sub> )	0,005	-0,015	0,813	
Fraud Detection (Y)	0,342	0,443	0,357	0,818

The results of the Fornell-Larcker Criterion test in Table 4 above show that all research constructs meet the discriminant validity criteria, because the AVE square root value for each construct is greater than the correlation value between other constructs. This indicates that each variable in the study has a unique concept and there is no overlap between constructs, so the measurement model is suitable for further structural analysis.

The reliability test for the variables in this study is indicated by the composite reliability and Cronbach's alpha values. The parameters used to indicate that the variables are reliable are composite reliability and Cronbach's alpha, which must be greater than 0,70 (Hair et al., 2019). Internal consistency reliability was established through Cronbach's alpha and composite reliability values exceeding 0,70 for all constructs. Composite reliability values ranged from 0,910 to 0,978, indicating strong reliability. The following data on composite reliability and Cronbach's alpha values are presented in Table 5 below.

Table 5. Composite Reliability and Cronbach's Alpha Results Test

Variabel	Cronbach's alpha	Composite reliability (rho_a)	Composite reliability (rho_c)	Result
BOB (moderation)	0,964	0,967	0,968	Reliabel
E-procurement (X <sub>1</sub> )	0,960	0,962	0,965	Reliabel
E-government (X <sub>2</sub> )	0,976	0,977	0,978	Reliabel
Fraud detection (Y)	0,876	0,876	0,910	Reliabel

Based on the reliability test results in Table 5 above, all variables in this study meet the reliability criteria, both based on Cronbach's alpha and Composite Reliability (rho\_a and rho\_c). This indicates that all indicators in each construct have good to very good internal consistency, so that the measurement model is declared reliable and suitable for use in further analysis, such as structural model testing (inner model).

**Structural Model Analysis (Inner Model)**

*Coefficient of Determination (R<sup>2</sup>)*

The coefficient of determination uses R-squared, which shows the percentage of variation in the endogenous/criterion construct that can be explained by the construct hypothesised to influence it (exogenous/predictor) (Hair et al., 2019). The following is Table 6 regarding the R-squared value.

Table 6. R-square adjusted coefficient Result Test

	R-square	R-square adjusted
Fraud detection (Y)	0,642	0,636

The R-square (R<sup>2</sup>) value is used to explain how much of the variation in the dependent variable can be explained by all the independent variables in the structural model. The R<sup>2</sup> value ranges from 0 to 1; the closer it is to 1, the better the model explains the variability of the data (Setiabudhi et al., 2025). The results of the analysis in Table 6 above show that the R-square value is 0,642 and the adjusted R-square is 0,636 for the fraud detection variable (Y). The adjusted R-square value is used as the main reference because it has considered the number of predictor constructs in the model.

The adjusted R-square value of 0,636 indicates that 63,6%of the variation in fraud detection can be explained by the variables of e-procurement (X<sub>1</sub>), e-government (X<sub>2</sub>), AKHLAK organisational culture (M), and the interaction (moderation) effect between organisational culture and the two independent variables. Meanwhile, the remaining 36,4% is explained by other factors outside the research model. Based on the criteria Setiabudhi et al., (2025) an R-square value above 0,50 indicates that the structural model has substantial explanatory power, so that the research model is considered good at explaining the phenomenon of fraud detection in public organisations.

*Effect Size (F<sup>2</sup>)*

The f-square value is classified into three categories, namely small (0,02), medium (0,15), and large (0,35) (Hair et al., 2019; Setiabudhi et al., 2025).

Table 7. F-square adjusted coefficient Results Test

Model	f-square	effect
BerAKHLAK Organizational culture → Fraud detection	0.384	Large Effect.
Moderation effect (Culture × E-procurement)	0.197	Medium Effect
Moderation effect (Culture × E-government)	0.299	Medium-To-Large Effect
E-procurement → Fraud detection	0.560	Large Effect
E-government → Fraud detection	0.355	Large Effect

The results of the analysis in Table 7 above show that the structural model of the study has strong explanatory power and substantive inter-variable effects. Fraud detection is not only influenced by the implementation of digital government systems, but is also reinforced by an ethical organisational culture, both as an independent variable and as a moderating variable. These findings reinforce the argument that the success of government digitalisation in supporting fraud detection is highly dependent on the quality of the underlying organisational culture.

*Path Coefficients and Hypothesis Testing*

Table 8. Path Coefficients and Hypothesis Test

Model	Path Coefficient	Original Sample (O)	T Statistics ((O/STDEV))	P Values	Result
E-procurement -> Fraud detection	0.451	0.451	12.119	0.000	Accepted
E-government -> Fraud detection	0.357	0.357	9.284	0.000	Accepted
BerAKHLAK organizational culture x E-procurement -> Fraud detection	0.307	0.304	7.226	0.000	Accepted
BerAKHLAK organizational culture x E-government -> Fraud detection	0.315	0.313	9.729	0.000	Accepted

Based on Table 8, the results of the hypothesis testing above explain that the four hypotheses in this study are accepted based on the path coefficient and P-value results of the study, namely:

Hypothesis 1: The significant positive effect of e-procurement on fraud detection. The results of testing the path of e-procurement on fraud detection show the highest path coefficient value, which is 0,451, with t-statistics of 12,119 and P-values of 0,000. This indicates that e-procurement is the variable that has the strongest influence on fraud detection compared to other independent variables. The implementation of transparent and digitally-based e-procurement significantly improves an organisation's ability to detect procurement fraud. Thus, the first hypothesis is accepted.

Hypothesis 2: The significant positive effect of e-government on fraud detection. The path coefficient for e-government on fraud detection is 0,357, with t-statistics of 9,284 and P-values of 0,000. These results show that good e-government implementation has a positive and significant effect on improving fraud detection capabilities. A transparent and integrated e-government system can reduce the chances of fraud occurring. Therefore, the second hypothesis is accepted.

Hypothesis 3: The role of AKHLAK organisational culture in moderating the relationship between e-procurement and fraud detection. The path of AKHLAK organisational culture in moderating the relationship between e-procurement and fraud detection has a path coefficient value of 0,307, with t-statistics of 7,226 and P-values of 0,000. This value indicates that AKHLAK organisational culture strengthens the influence of e-procurement on fraud detection. This means that the stronger the AKHLAK culture in an organisation, the more effective the e-procurement system will be in detecting fraud. Thus, the third hypothesis is accepted.

Hypothesis 4: The role of AKHLAK organisational culture in moderating the relationship between e-government and fraud detection. The test results show that the AKHLAK organisational culture pathway is able to moderate the relationship between e-government and fraud detection, as can be seen from the path coefficient value of 0,315, with t-statistics of 9,729 and P-values of 0,000. These results indicate that AKHLAK organisational culture also acts as a moderating variable that strengthens the influence of e-government on fraud detection. The implementation of e-government will be more effective in improving fraud detection capabilities if it is supported by strong organisational ethical values and integrity. Therefore, the fourth hypothesis is accepted.

The findings of this study indicate that digital governance mechanisms specifically e-procurement and e-government significantly enhance fraud detection capabilities in high-risk public procurement environments. Of the two, e-procurement exhibits the strongest direct effect, suggesting that digitalization embedded directly in the procurement process provides more direct control over fraud-prone transactions than broader administrative digitalization. These results suggest that fraud detection is most effective when digital systems operate at the transactional core of inter-agency relationships, rather than simply at the information or reporting level. These results support Agency Theory, which posits that opportunistic behavior arises from information asymmetry and weak oversight structures; digital systems mitigate these asymmetries by strengthening traceability, transparency, and real-time oversight (Khan et al., 2021; Mansyuri & Ramadhan, 2024a).

However, the study also revealed that digital systems alone do not fully explain the effectiveness of fraud detection. The significant moderating role of a BerAKHLAK organizational culture confirms that the impact of digital governance is conditional, not automatic. This finding challenges the deterministic assumption of technology prevalent in some e-government literature, which often equates digital maturity with reduced corruption (Adam, 2020; Ali et al., 2021). Instead, this study shows that digital transparency becomes operationally meaningful only when embedded in an ethical organizational environment that discourages rationalization of behavior and collective adaptation. From a theoretical perspective, this reinforces the multidimensional nature of fraud articulated in the Fraud Hexagon framework (Vousinas, 2019). While digital systems constrain the opportunity dimension, organizational culture suppresses rationalization, ego, and collusion, thus addressing behavioral drivers that cannot be eliminated by technology alone.

The interaction effects observed in this study provide empirical evidence that formal and informal controls operate synergistically. Digital governance serves as a structural control mechanism that formalizes monitoring, while ethical culture serves as an internal normative constraint that shapes behavioral intentions. This dynamic aligns with the Theory of Planned Behavior (Ajzen, 1991), where perceived behavioral control (enhanced by digital systems) interacts with subjective norms (shaped by ethical culture) to influence fraud-related decision-making. Thus, fraud detection capabilities arise not simply from procedural automation but from the alignment between institutional systems and internal

values. Compared with previous research, this study extends the literature in several ways. Existing studies largely examine e-procurement and e-government in relation to corruption perception indices, transparency outcomes, or macro-level governance indicators (Arayankalam et al., 2021; Zhao et al., 2021). Only a few studies place fraud detection capability as the primary dependent construct at the organizational level. Thus, this study shifts the analytical focus from macro-level corruption reduction to micro-level detection mechanisms within a specific administrative context. Furthermore, although previous research acknowledges the importance of institutional quality and ethical climate (Maulidi & Ansell, 2021; Safkaur et al., 2025), these variables are rarely modeled as moderators within a digital structural governance framework. The current findings empirically validate that organizational culture is not only a contextual background but also a conditional amplifier of digital control effectiveness.

The  $R^2$  result of 0,636 indicates that digital system integration and ethical culture capture a significant portion of the variance in fraud detection capability. This suggests that persistent procurement fraud in digitally mature environments may stem less from technological inadequacies and more from inadequate ethical internalization. Consequently, this study proposes a more nuanced theoretical position: digital governance only mitigates agency problems if supported by complementary social-organizational mechanisms. This argument contributes to Agency Theory by introducing a conditional governance perspective, where technological monitoring reduces information asymmetry, but behavioral alignment determines enforcement effectiveness.

In general, these findings are highly relevant for public sector organizations operating under high procurement complexity and pressures of institutional reform. In the context of developing countries, where digital transformation often progresses faster than cultural adaptation, the mismatch between formal systems and informal norms may explain the recurrence of fraud cases despite technological advances. While caution is needed in extrapolating beyond the studied ministry, the identified theoretical mechanism, which is the interaction between formal digital controls and informal ethical constraints, may apply to similar bureaucratic environments characterized by high discretion and complex procurement cycles.

The practical implications are equally significant. Based on the findings of this study, it can be argued that policymakers should reconceptualize digital governance investments not as stand-alone anti-corruption solutions, but as components within an integrated governance ecosystem. E-procurement and e-government systems must be accompanied by deliberate ethics strengthening strategies, including leadership-driven integrity modeling, ethics training, accountability-based performance systems, and internal compliance monitoring. Without such strengthening, digital systems risk becoming instruments of symbolic compliance rather than substantive fraud detection mechanisms. This aligns with previous arguments that technological innovation without institutional quality yields limited anti-corruption impact (Wu et al., 2020; Khan et al., 2021).

The uniqueness of this study lies in the development of an integrated moderated structural model that bridges technological and behavioral explanations of fraud detection. By empirically demonstrating the conditional nature of the effectiveness of digital fraud control, this study transcends the binary debate about whether e-government reduces corruption. Instead, it offers a configurational perspective in which digital governance is necessary but not sufficient, and its effectiveness hinges on ethical-cultural alignment. This conceptual integration contributes to the growing discourse on digital-era governance by emphasizing that sustainable fraud control requires systems-based and values-based controls operating simultaneously. Despite its contributions, this study has limitations. Its reliance on self-reported survey data introduces potential perception bias, and its cross-sectional design limits causal inference. Furthermore, the single-ministry context limits external validity, and objective fraud case data were not included to triangulate detection results. Future research should employ a longitudinal design, integrate archival audit data, and conduct cross-ministerial or cross-country comparisons to test the robustness of the proposed conditional governance model. Further investigation of additional moderating mechanisms such as leadership integrity, risk management maturity, or digital literacy would also enrich the theoretical framework.

## CONCLUSION

This study aims to examine whether digital governance mechanisms, specifically e-procurement and e-government, enhance fraud detection capabilities and whether their effectiveness is influenced by organizational culture. The findings provide clear empirical support that both e-procurement and e-government significantly enhance fraud detection, with e-procurement exerting the strongest direct effect.

More importantly, the results show that a BerAKHLAK organizational culture positively moderates this relationship, confirming that digital systems operate more effectively in ethically reinforced institutional environments. The results also shed light on the broader conceptual proposition that digital governance should be understood as a conditional control mechanism within Agency Theory. While digital systems reduce information asymmetry and constrain opportunity structures, their fraud detection effectiveness depends on complementary organizational social controls. This study also integrates Agency Theory with the Fraud Hexagon framework by demonstrating that technological controls suppress structural opportunities, while an ethical culture reduces rationalization and behavioral drivers. Thus, fraud detection capabilities emerge from the alignment between formal digital monitoring and internalized ethical norms. Theoretically, this study provides a configurational perspective on digital governance research, going beyond the deterministic assumption that technology alone reduces corruption. Practically, these findings imply that anti-fraud strategies in the public sector must combine the development of digital infrastructure with the ongoing strengthening of an ethical culture. Investments in e-procurement and e-government without parallel strengthening of integrity risk producing procedural compliance rather than substantive fraud control. In conclusion, effective fraud detection in digital-era governance is not only a function of technological sophistication but also of institutional alignment. Sustainable fraud control requires the integration of system-based transparency and value-based accountability within public organizations.

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### AUTHOR CONTRIBUTIONS

Author 1: Conceptualization, Data Collection, Data Analysis, Writing, Translation, and Funding; Author 2: Supervision, and Methodology; Author 3: Supervision; Author 4: Conceptualization, Supervision, Review, and Editing.

### CONFLICTS OF INTEREST

The author(s) declare no conflict of interest.

### USE OF ARTIFICIAL INTELLIGENCE (AI)-ASSISTED TECHNOLOGY

The authors declare that no artificial intelligence (AI) tools were used in the generation, analysis, or writing of this manuscript. All aspects of the research, including data collection, interpretation, and manuscript preparation, were carried out entirely by the authors without the assistance of AI-based technologies.

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