

Implementation of E-Procurement in Preventing Fraud Goods and Services Procurement

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ABSTRACT

The goods and services procurement phase is highly susceptible to fraud. Although the implementation of e-procurement is deemed capable of achieving transparency and efficiency, views still differ on the extent to which this electronic system can reduce fraud. This study examines how each stage of e-procurement implementation affects fraud prevention in public procurement. A quantitative approach was applied through a Likert-scale questionnaire distributed purposively to e-procurement users in the Banyuasin Regency Government. Of the 168 questionnaires distributed, 126 were completed in full and analysed by multiple linear regression. The research findings demonstrate that the planning stage, the committee formation stage and the bid evaluation stage have a positive and significant effect on fraud prevention, whereas the prequalification, tender document preparation, announcement and disclaimer stages do not. The contribution of this study is to identify the stages that act as effective control points within the e-procurement cycle, so that oversight can be strengthened selectively.

Keywords: Crowe's Fraud Pentagon Theory; E-Government; E-Procurement; Fraud Prevention; Procurement of Goods and Services

Implementasi E-Procurement dalam Mencegah Kecurangan Pengadaan Barang dan Jasa

ABSTRAK

Tahap pengadaan barang dan jasa rentan terhadap tingginya potensi kecurangan. Walaupun implementasi e-procurement dinilai dapat mewujudkan transparansi dan efisiensi, pandangan mengenai sebatas apa sistem ini mampu menekan tindak kecurangan nyatanya masih beragam. Penelitian ini menguji pengaruh setiap tahap penerapan e-procurement terhadap pencegahan kecurangan pengadaan barang dan jasa. Pendekatan kuantitatif digunakan melalui kuesioner berskala Likert yang disebarkan secara purposive kepada pengguna e-procurement di Pemerintah Kabupaten Banyuasin. Dari 168 kuesioner yang disebarkan, 126 kuesioner terisi lengkap dan dianalisis dengan regresi linear berganda. Hasil penelitian membuktikan bahwa tahap perencanaan, tahap pembentukan panitia, beserta tahap evaluasi penawaran berpengaruh positif dan signifikan terhadap pencegahan kecurangan, sebaliknya untuk tahap prakualifikasi, penyusunan dokumen tender, pengumuman, dan sanggah tidak berpengaruh signifikan. Kontribusi penelitian ini adalah mengidentifikasi tahap yang berfungsi sebagai titik kendali efektif dalam siklus e-procurement, sehingga penguatan pengawasan dapat diarahkan secara selektif.

Kata Kunci Crowe's Fraud Pentagon Theory; E-Government; E-Procurement; Pencegahan Fraud; Pengadaan Barang dan Jasa

Artikel dapat diakses : <https://ejournal1.unud.ac.id/index.php/akuntansi/index>



e-ISSN 2302-8556

Vol. 36 No. 8
Denpasar, 31 Agustus 2026
Hal. 1504-1523

DOI:
10.24843/EJA.2026.v36.i08.p01

PENGUTIPAN:
Aziz, F., Dewata, E., & Wahyudi, R. (2026). Implementation of E-Procurement in Preventing Fraud Goods and Services Procurement. *E-Jurnal Akuntansi*, 36(8), 1504-1523

RIWAYAT ARTIKEL:
Artikel Masuk:
23 Juni 2026
Artikel Diterima:
15 Juli 2026

INTRODUCTION

Procurement of goods and services plays a crucial role in public governance, and procurement of goods and services globally is very vulnerable to fraud and corruption; this practice poses a significant barrier to the development of the country as it can undermine the achievement of goals (Periansya et al., 2023). In Indonesia, data from Komisi Pemberantasan Korupsi (KPK) shows an increasing trend in corruption cases in the procurement sector. In 2024, this sector recorded the highest number with 68 cases (KPK, 2025). The high numbers make the procurement of goods and services one of the sectors most vulnerable to corruption crimes in Indonesia. This challenge is not only present in Indonesia, as a global survey by Price Waterhouse Coopers (PwC) categorizes procurement fraud as one of the three most harmful economic crimes, alongside cybercrime and corruption. Although digital technologies have the potential to enhance transparency and oversight in procurement, technological advances are also exploited by criminals to commit fraud in increasingly sophisticated ways (PwC, 2024). Based on the 2023 Audit Report by the Badan Pemeriksa Keuangan (BPK), the Banyuasin Regency Government also faces similar issues, such as project delays, the selection of noncompetitive providers, and non-compliance with Peraturan Presiden Number 12 of 2021 (BPK, 2025).

Systematic weaknesses in the procurement process create opportunities for fraud, such as collusion and price manipulation, which not only cause financial losses to the state (Lyra et al., 2022) but also damage institutional integrity and erode public trust (Ríos et al., 2023). To address these issues, well planned strategic measures are necessary (Mansyuri, 2024). Despite the inability to eradicate fraud, preventive measures need to be embraced in order to mitigate potential reputational impairments, especially concerning the organization's risk of loss (Mohamed et al., 2021; Wardani et al., 2021). Strengthening the procurement system by enhancing transparency and accountability at each and every process stage is one way to achieve this (Ismail Khan et al., 2022; Prakasa et al., 2023).

E-procurement as a technology enhances transparency and efficiency because it reduces contacts between suppliers and procurement officials (Norziaton et al., 2021; Silalahi et al., 2023; Wahyuni, 2023). This system minimizes the chances of irregularities, increases accountability, and broadens supplier access to markets which improves competition and responsibility in the procurement process (Kusumadewi et al., 2022; Putri et al., 2024; Zahra et al., 2021).

The implementation of e-procurement systems has numerous advantages; however, it is often not realized in practice, which is evident from the persistent incidence of corruption in procurement (Mu'ah et al., 2024). This suggests that the question of whether e-procurement is effective in combating fraud remains highly contested in scholarly circles. Additionally, there are several opposing proposals. Some research indicates that e-procurement has a positive impact on fraud prevention efforts (Kassyar et al., 2023), Others argue that due to gaps during the execution stage of the e-procurement cycle, the system is not yet deemed fully effective (Safitri et al., 2024).

Most research has examined the application of e- Procurement to prevent fraud, but each stage of procuring goods and services still holds potential for fraud (Haryono, 2022). Prior studies, however, share two limitations. First, they

predominantly treat e-procurement as a single aggregate construct, so that a significant overall effect conceals which specific stage actually works and which does not (Astuti & Prabowo, 2023; Kassyar et al., 2023). Second, the few studies that do decompose the procurement cycle report inconsistent results across stages and are not anchored in an explicit fraud theory, so the mechanism through which each stage suppresses fraud remains unexplained (Safitri et al., 2024). This study addresses both gaps. Its novelty lies in disaggregating e-procurement into seven sequential stages and testing each stage as a separate independent variable, and in using Crowe's Fraud Pentagon Theory as the explanatory lens that links every stage to the specific fraud driver it is expected to suppress, namely pressure, opportunity, rationalization, competence and arrogance. Positioning the study in this way shifts the research question from whether e-procurement prevents fraud to which control points within the e-procurement cycle prevent fraud and why, which is precisely the information a procuring entity needs in order to allocate its limited oversight capacity. Since a gap in the existing literature has been identified, this research innovates with more specific studies by formulating the problem of how the stage of planning, the formation of committees, the prequalification stage, the preparation of tender documents, the evaluation of bids, the announcement stage, and the disclaimer stage influence fraud prevention in the government of Banyuwangi Regency? This research aims to identify the stage in the e-procurement that play a significant role in reducing the risk of fraud in the procurement of goods and services within the local government authorities of the Banyuwangi regency. It is expected that this research will provide concrete and measurable policy recommendations for improving procurement governance in both the public and private sectors, by utilizing more integrated and effective technologies to mitigate fraud.

The results of earlier development theories, namely Cressey's Fraud Triangle (1953) and Wolfe and Hermanson's Fraud Diamond (2004). Crowe's Fraud Pentagon theory adds competence and arrogance (Horwath, 2011), and offers a more comprehensive perspective for understanding fraud in e-procurement. Technological advancements play a strategic role, although e-procurement can limit opportunities through transparency, the risk of fraud does not disappear completely. The pressure from pressure and rationalization remains the main motivation. However, in a digital context, the perpetrator's competence in exploiting system gaps becomes a critical factor, while arrogance conveys the belief that they will not be caught by the automated system. Therefore, the analysis of these five elements will serve as the basis for implementing a more robust eprocurement against fraud.

Fraud prevention is a fundamental activity that must be consistently implemented in the procurement process of goods and services by adhering to legal principles and practices, and by prioritizing transparent and open procedures to combat corruption (Pope, 2007). Nevertheless, the procurement stage remain vulnerable to abuse, such as collusion practices between procurement parties and suppliers or among the suppliers themselves, aimed at unlawfully securing contracts or manipulating prices (Astuti & Prabowo, 2023). Therefore, efforts for fraud prevention in all sectors, including finance, economy, and

technology, are crucial for identifying illegal activities, avoiding financial losses, and protecting the organization's reputation (Zioviris et al., 2024).

E-procurement is a procurement system for goods/services that is implemented based on information technology and electronic transactions. The legal basis for this process is specifically regulated in Peraturan Presiden Number 46 of 2025 concerning the Second Amendment to Peraturan Presiden Number 16 of 2018 (Republik Indonesia, 2025). The stage of procuring goods and services through e-procurement consists of a series of systematic stages, including the planning stage, the formation of committees, the prequalification stage, the preparation of tender documents, the evaluation of bids, the announcement stage, and the disclaimer stage (Oemarmadi et al., 2009).

Well organized procurement planning increases operational efficiency and contributes to project success (Nuwagaba et al., 2021). To address the identified needs, thorough and precise planning is needed (Changalima & Mdee, 2023). Additionally, planning serves as a guide for managing the budget to prevent waste, as unexpected costs often cause expenditures to exceed the allocated limits (Changalima & Mdee, 2023). As per the pressure dimension of Crowe's Fraud Pentagon Theory, its fourth vertex contends that if the procurement committee prepares needs and targets with cost allocations that are transparent and seen to be managed responsibly, the need to commit fraud is minimized greatly. Enacted with informative role, the hypothesis states:

H₁: Procurement Planning Stage has positive and significant influence on the prevention of fraudulent procurement of goods and services.

Procurement performance is best achieved when users and other relevant stakeholders are drawn into planning the process early and when accurate cost estimation is done (Nuwagaba et al., 2021). The primary objective of the procurement committee formation is to promote the principles of fairness, transparency, and compliance with set legal frameworks guiding the process (Aryal et al., 2023). Moreover, enhancing committee member's training and certification mitigates fraud risk greatly (Vania et al., 2023). This aligns with the arrogance dimension in Crowe's Fraud Pentagon Theory, which states that competent and highly integrous committee members tend not to exhibit arrogance, thereby reducing the likelihood of fraud. Therefore, the hypothesis proposed for the committee formation stage is:

H₂: Committee Formations Stage has positive and significant influence on the prevention of fraudulent procurement of goods and services.

The criteria that need to be addressed on the contractor prequalification stage include management capability, workforce their quality, reputation of the company, financial situation, as well as company's experience and work skills to ensure that the selected contractors fully meets (Ameh & Kayode, 2023). This is to ensure that there is openness and unresponsive or incompetent contractors do not get awarded the contracts (Raphael et al., 2021). Therefore, an thorough assessment process at the prequalification stage needs to be done so that only competent and qualified contractors are invited which ensures success of the projects (Chinedu et al., 2021). In relation to the opportunity dimension of Crowe's Fraud Pentagon Theory, along with the opportunity to advance, the winner is selected based on rigid adherence to technical and administrative prerequisites at the

prequalification stage. All documents must undergo stringent scrutiny to eliminate any potential fraud loopholes. With this, the following hypothesis is posited:

H₃: Prequalification Stage has positive and significant influence on the prevention of fraudulent procurement of goods and services.

The review of tender documents by the authorized parties is a crucial stage before the procurement process can proceed (Govender et al., 2022). This stage aims to ensure that the tender documents are accurate, clear, complete, and relevant. The tender documents serve to establish the contract criteria for construction projects while preventing the awarding of contracts to fictitious or incapable contractors (Raphael et al., 2021). This review process is necessary to ensure the objectives of public policy goals are met (Niewerth et al., 2022), and e-procurement systems have greatly increased public openness (Raya & González-Sánchez, 2020). Referring to the opportunity dimension in Crowe's Fraud Pentagon Theory, prompt and thorough preparation of tender documents is transparent, which greatly reduces the possibility of fraud. Based on this, and supported by previous research (Safitri et al., 2024) which shows that the tender document preparation stage is effective in preventing fraud, the following hypothesis is proposed:

H₄: Tender Document Preparation Stage has positive and significant influence on the prevention of fraudulent procurement of goods and services.

The digitalization of the bidding evaluation process has become very important in procurement, as it helps identify offers that not only optimally meet the customer's requirements and regulations, but also support the overall sustainability of the project (Meschini et al., 2022), while ensuring transparency, competition, efficient use of public funds, equal treatment of all bidders, and the provision of the best services. Its importance is based not only on price and quality criteria (Mucha et al., 2023), but also on various aspects such as life cycle costs, environmental and social factors, especially in public construction projects (Niewerth et al., 2022). This is in line with the dimension of competence in Crowe's Fraud Pentagon theory. Although the price evaluation is more focused on the suitability of the bids according to the committee's criteria, this extended evaluation stage requires and thus promotes the competence of the evaluator in analyzing various aspects, which significantly reduces the scope for fraud. Earlier research (Safitri et al., 2024) emphasizes that a comprehensive evaluation stage of the offers prevents fraud. Therefore, the hypothesis of the evaluation stage of the offers can be formulated as follows:

H₅: Bid Evaluation Stage has positive and significant influence on the prevention of fraudulent procurement of goods and services.

The government's demand for infrastructure and other daily necessities is fulfilled through contracts with vendors who offer their services via tender announcements (Alanzi, 2021). These tender result announcements must reflect clear and accurate information (Suresha et al., 2024), as understanding and characterizing public procurement announcements is fundamental for effective management of public resources (García Rodríguez et al., 2019). In this regard, it aligns with Crowe's Fraud Pentagon theory in the dimension of opportunity, that the use of e-procurement, which facilitates the publication of

procurement opportunities, can promote transparency and prevent fraud. According to previous research (Safitri et al., 2024), the more open and accessible procurement information is, the fewer opportunities there are for perpetrators to exploit loopholes in the system. Therefore, the hypothesis for the announcement stage is:

H₆: Announcement Stage Stage has positive and significant influence on the prevention of fraudulent procurement of goods and services.

Digital technology greatly helps enhance fairness and transparency in the final procurement decision making process, as evaluation results and contract awards can be communicated and explained openly (Moshtari et al., 2021). Additionally, this technology also assists in achieving optimal cost efficiency through transparent procedures and a clear market environment (Matas et al., 2025). The use of e-procurement is an important strategy to reduce costs, increase transparency, and potentially prevent corruption in the procurement process (Mackey & Cuomo, 2020). In line with the rationalization dimension of Crowe's Fraud Pentagon Theory, when all disclaimer results are published openly, it can hinder fraud perpetrators from justifying their actions because every decision and disclaimer process is under public scrutiny. This transparency, supported by digital technology, makes the disclaimer stage effective in preventing fraud, as also demonstrated by previous research (Safitri et al., 2024). Based on this, the following hypothesis is proposed:

H₇: Disclaimer Stage has positive and significant influence on the prevention of fraudulent procurement of goods and services.

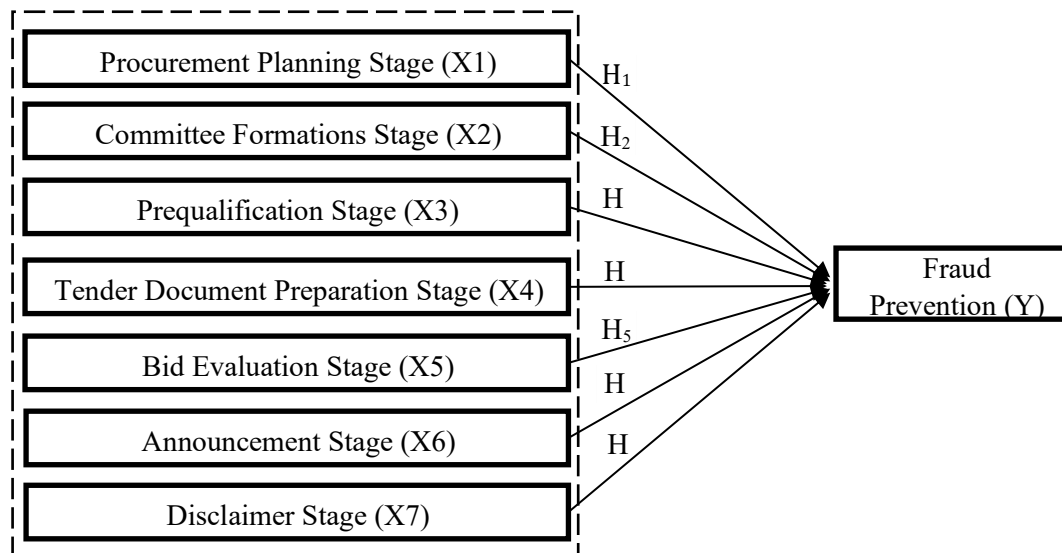


Figure 1. Research Framework.

Source: Research Data, 2025

RESEARCH METHOD

This research applies a quantitative approach through survey methods to test hypotheses about the relationships between variables. Primary data was collected using a questionnaire with a 1-5 Likert scale. The research sample was selected from the population of government employees in the Banyuasin district

government involved in the procurement of goods/services using non-random sampling methods, specifically purposive sampling. All collected data was subsequently processed with Statistical Package for the Social Sciences (SPSS) Version 26 and analyzed with quality checks of the instruments (validity and reliability), classical assumption tests (multicollinearity), and multiple linear regression analysis (F-tests and t-tests). The details of the research population and the sample are outlined as follows:

Table 1. Population Data and Research Sample

The Population	Only Civil Servants can use e-procurement in the Banyuasin Regency Government	5920 respondent
Sample	<i>Non probability sampling - Purposive sampling</i>	
	1. Budget User Officer (PA)	51 respondent
	2. Commitment Maker Official (PPK)	51 respondent
	3. Procurement Official (PP)	51 respondent
	4. Working Group of the Procurement of Goods and Services Unit (Pokja UKPBJ)	15 respondent
Number of Samples		168 respondent

Source: Research Data, 2025

All constructs were measured with a self-administered questionnaire using a five-point Likert scale, where 1 = strongly disagree and 5 = strongly agree. The instrument consists of 65 statement items in total, comprising 27 items for fraud prevention (Y) and 38 items distributed across the seven e-procurement stages (X1-X7). The indicators of fraud prevention were adapted from Pope (2007) and Dewata et al. (2022), while the indicators of the seven stages were adapted from Faisol et al. (2014, 2015) and Safitri et al. (2024), with the sequence of the stages following Oemarmadi et al. (2009). The score of each construct is the sum of its item scores, so that a higher score reflects a stronger perceived implementation of the stage concerned. Table 2 presents the operationalisation of each variable, its indicators, the number of items per indicator and in total, the source of the indicators, and the measurement scale.

Table 2. Operationalisation and Measurement of Variables

Variable	Indicators (number of items)	Total Items	Source of Indicators
Fraud Prevention (Y)	Strengthening the legal framework (5); transparent procedures (5); opening of tender documents (3); evaluation of bids (5); delegation of authority (5); independent inspection and audit (4)	27	Pope (2007); Dewata et al. (2022)
Planning Stage (X ₁)	Preparing quality and cost in line with needs (2); formulating technical specifications and procurement criteria (2); determining the procurement schedule (1); dividing and arranging procurement packages (2)	7	Faisol et al. (2014, 2015); Safitri et al. (2024)
Committee Formation Stage (X ₂)	Professionalism principle (1); responsiveness principle (1); accountability principle (2); credibility principle (1); independence principle (1)	6	Faisol et al. (2014, 2015); Safitri et al. (2024)

Variable	Indicators (number of items)	Total Items	Source of Indicators
Prequalification Stage (X ₃)	Administrative requirements (2); technical requirements (1); company experience and capability to take part in the tender (2)	5	Faisol et al. (2014, 2015); Safitri et al. (2024)
Tender Document Preparation Stage (X ₄)	Conformity with prevailing regulations (1); simplicity and transparency of the documents (2); review by the related parties and completeness of the documents covering scope of work, quality, quantity, size, type, implementation time and work method (2)	5	Faisol et al. (2014, 2015); Safitri et al. (2024)
Bid Evaluation Stage (X ₅)	Administrative evaluation considering editorial aspects, validity, bid security and arithmetic (2); technical evaluation considering certification documents from credible accreditation bodies (2); price evaluation emphasising the conformity of the bid (1)	5	Faisol et al. (2014, 2015); Safitri et al. (2024)
Announcement Stage (X ₆)	Announcement published in the mass media (1); clear and detailed announcement (2); timely implementation without postponement (2)	5	Faisol et al. (2014, 2015); Safitri et al. (2024)
Disclaimer Stage (X ₇)	Committee openness and accommodation in handling every objection (1); publication of objections and responses (2); investigation of the truth of the objection and administrative sanctions for unfounded objections (2)	5	Faisol et al. (2014, 2015); Safitri et al. (2024)

Source: Research Data, 2025

The instrument quality was tested on the 126 returned questionnaires. All 65 items are valid, with item-total correlations ranging from 0.316 to 0.902, each exceeding the critical value of $r\text{-table} = 0.175$ ($n = 126$; $\alpha = 0.05$). All eight constructs are reliable, with Cronbach's alpha ranging from 0.774 for the bid evaluation stage to 0.943 for fraud prevention, all above the 0.70 threshold. The classical assumption test shows that multicollinearity is absent, with tolerance values of 0.271-0.575 and VIF values of 1.739-3.694, all within the accepted limits of tolerance > 0.10 and $VIF < 10$. The seven hypotheses were then tested with multiple linear regression using SPSS version 26, in which each stage is entered as a separate independent variable.

RESULTS AND DISCUSSION

Out of a total of 168 respondents who received the questionnaire, 126 respondents or 75% completed the questionnaire in full, allowing their data to be further processed. Table 3 presents descriptive statistics for the eight research variables, namely fraud prevention, planning stage, committee formation stage, prequalification stage, preparation of tender documents stage, bid evaluation stage, announcement stage, and disclaimer stage. All these variables were

measured using a Likert scale of 1–5, indicating the degree of evaluation or perception of the respondents regarding each research aspect. This descriptive statistic provides an overview of the responses and perceptions of the respondents regarding various stages and efforts in fraud prevention in procurement for goods and services as follows:

Table 3. Result of Descriptive Analysis

Variable	Items (k)	Mean	Std. Deviation
Fraud Prevention (Y)	27	4.45	0.351
Planning Stage (X ₁)	7	4.25	0.425
Committee Formations Stage (X ₂)	6	4.38	0.404
Prequalification Stage (X ₃)	5	4.41	0.416
Tender Document Preparation Stage (X ₄)	5	4.42	0.441
Bid Evaluation Stage (X ₅)	5	4.17	0.506
Announcement Stage (X ₆)	5	4.27	0.422
Disclaimer Stage (X ₇)	5	4.28	0.466

Source: Research Data, 2025

From Table 3, it can be seen that all average values (means) above 4.17 indicate a high level of agreement, which means that the respondents generally strongly agree that each stage of procurement and its preventive measures were well implemented. The highest rating was recorded for the variable on Fraud Prevention (Y) with 4.45, indicating a very strong perception that the measures for fraud prevention are effective. Among the procurement stages, the stage of preparing tender documents (X₄) also shows a very high level of satisfaction from the respondents with a score of 4.42.

In the meantime, the Bid Evaluation Stage (X₅) received the lowest average rating (4.17). Although this score is still classified as very good, it indicates that the evaluation aspect is viewed as the area that requires the most attention or further improvements compared to the other stage. Once the standard deviations are expressed on the same 1-5 metric as the means, the diversity of responses is greatest at the Bid Evaluation Stage (X₅), which records the largest standard deviation (0,506) and also contains a minimum response of 1, indicating that perceptions of how bids are evaluated differ most widely among respondents. The Planning Stage (X₁) follows with a standard deviation of 0,425 and likewise contains a minimum response of 1, which suggests that some respondents did not consider planning to have been carried out optimally. In contrast, perceptions of the Committee Formations Stage (X₂) are the most homogeneous, with the smallest standard deviation (0,404), followed by the Prequalification Stage (X₃) with 0,416.

An explanation of the results of the data processing and the direction of the relationship between the variables can be found in Table 4. Based on Table 4, the results of the regression analysis indicate that this research model is suitable, with the seven stages of e-procurement, entered as seven separate independent variables, jointly explaining 63.8% of the variance in fraud prevention ($R^2 = 0.638$; adjusted $R^2 = 0.616$; $F = 29.650$; $F\text{-sig.} = 0.000$). The results of the test in the planning stage show a t-value of 3.611 with a significance level of 0.000. Since the t-value (3.611) > t-table (1.980) and the significance value (0.000) < 0.05, the hypothesis is accepted. This means that the planning stage (X₁) has positive a significant impact on fraud prevention.

Table 4. Results of data analysis

The Relationship Between Variables and Fraud Prevention	B	t	Sig.	Conclusion
Planning Stage (X ₁)	0,942	3,611	0,000	Accepted
Committee Formations Stage (X ₂)	0,863	2,073	0,040	Accepted
Prequalification Stage (X ₃)	0,519	1,123	0,264	Rejected
Tender Document Preparation Stage (X ₄)	0,591	1,458	0,148	Rejected
Bid Evaluation Stage (X ₅)	0,613	2,244	0,027	Accepted
Announcement Stage (X ₆)	-0,184	-0,503	0,616	Rejected
Disclaimer Stage (X ₇)	0,250	0,617	0,538	Rejected
F	29,650			
sig.	0,000			
R Square	0,638			
Adjusted R Square	0,616			

Source: Research Data, 2025

The Committee Formations Stage (X₂) shows a t-value of 2.073 with a significance level of 0.040. Since the t-value (2.073) > t-table (1.980) and the significance value (0.040) < 0.05, the hypothesis is accepted. This means that the Committee Formations Stage has a positive and significant effect on fraud prevention. In contrast, The Prequalification stage (X₃) shows different results with a t-value of 1.123 and a significance level of 0.264. Since the t-value (1.123) < t-table (1.980) and the significance value (0.264) > 0.05, the hypothesis is rejected. This means that the prequalification stage has no significant influence on fraud prevention.

The results of the test stage for The Preparation of The Document Tender (X₄) show a calculated t-value of 1.458 with a significance level of 0.148. Since the calculated t-value (1.458) < t-table (1.980) and the significance value (0.148) > 0.05, the hypothesis is rejected. This means that The Document Tender Preparation Stage has no significant impact on fraud prevention. In contrast to the previous results, The Bid Evaluation Stage (X₅) shows a calculated t-value of 2.244 with a significance level of 0.027. Since the calculated t-value (2.244) > t-table (1.980) and the significance value (0.027) < 0.05, the hypothesis is accepted. This means that The Bid Evaluation Stage has a positive and significant impact on fraud prevention.

The Announcement Stage (X₆) shows a t-hit value of -0.503 with a significance level of 0.616. Since the t-hit value (-0.503) < t-table (1.980) and the significance value (0.616) > 0.05, the hypothesis is rejected. This means that The Announcement Stage has no significant impact on fraud prevention. The final result, which is The Disclaimer Stage (X₇), shows a t-hit value of 0.617 with a significance level of 0.538. Since the t-hit value (0.617) < t-table (1.980) and the significance value (0.538) > 0.05, the hypothesis is rejected. This means that The Disclaimer Stage has no significant impact on fraud prevention.

The results of the analysis in Table 4 show that the planning stage has positive a significant impact on the prevention of fraud in the procurement of goods and services in Banyuasin Regency (t = 3.611; Sig. = 0.000), leading to the acceptance of hypothesis (H₁), although this result deviates from the findings of

(Safitri et al., 2024). Fraud prevention in the planning stage is supported by transparent and responsible preparation of procurement quality and costs from the very beginning. In Crowe's fraud pentagon theory, this transparency directly reduces the pressure that is the main impulse or motivation for someone to commit fraud. Through clarity and openness in every stage of planning, the likelihood of individuals feeling compelled to deviate is very low, as all aspects are already transparently regulated, and accounting can take place. Furthermore, thorough planning also reduces the opportunity for fraud by providing detailed arrangements and complete documentation that limit room for manipulation in the process, while careful preparation reflects the competence of the procurement committee, ensuring high professional standards and minimizing the risk of errors or deviations. To optimize the planning stage in Banyuasin Regency, it is recommended that the procurement committee break down large procurement packages into several smaller projects so that planning management can be more focused, detailed, and easier to supervise, thereby further minimizing the potential for fraud.

The committee formation stage in Table 4 shows the results ($t = 2.073$; Sig. = 0.040) indicating that the committee formation stage has a significant positive effect on the prevention of fraud in the procurement of goods and services in Banyuasin Regency, and the hypothesis (H_2) is accepted. This finding differs from the study (Safitri et al., 2024). Committees formed based on the members' capabilities and professionalism have adequate competence to carry out their duties effectively and responsibly, thereby improving the quality of supervision and control over the procurement process. According to Crowe's Fraud Pentagon Theory, the formation of a professional committee can reduce the arrogance dimension, as committee members with integrity tend to be humble and focused on compliance. Moreover, the formation of the right committee also reduces the opportunity of fraud occurring by tightening oversight and limiting the scope for manipulation in the procurement process. The high competence of the committee reflects an important dimension of capability to prevent errors and deviations. As a practical consequence in the stage of committee formation in the Banyuasin government regency, it is expected that the committee will prepare the bidding documents transparently and accountably. This will further strengthen internal control and minimize the risk of fraud in the procurement of goods and services.

Result Table 4, the results of the prequalification stage show no significant effect on fraud prevention in the procurement of goods and services in Banyuasin Regency ($t=1.123$; Sig. 0.264), thus the hypothesis (H_3) is rejected. This finding is consistent with the study (Safitri et al., 2024). The selection of administrative documents, despite being done openly, has not contributed significantly towards the prevention of fraud. This suggests the existence of the Opportunity component of Crowe's Fraud Pentagon Theory, which argues that transparency devoid of rigorous checks permits fraud to flourish. Thus, it is crucial to look at the experiences and skills of the companies at the prequalification stage rather than just the submission of administrative documents. This reduces the chances for incompetent and malicious participants, and therefore, the risk of fraud is minimized.

Table 4 of the analysis results showed that the tender document preparation stage has no impact on fraud prevention in the procurement of goods and services in the Banyuasin district ($t=1.458$; Sig. 0.148), which is why the hypothesis (H_4) is rejected. This finding differs from the research (Safitri et al., 2024). In Crowe's fraud pentagon theory, this can be linked to the dimension of opportunity, as the mere preparation of tender documents according to regulations does not completely close gaps or spaces where perpetrators can commit manipulations or fraud. In other words, even if the documents meet formal standards, there remains the risk of fraud if supervision and other control mechanisms do not function optimally. As an implication for the preparation of the tender documents in Banyuasin Regency, to strengthen fraud prevention measures, the tender documents must be subjected to a review by the competent authorities to ensure that no gaps are overlooked, even if the basic principles are met, so that the risk of fraud can be further minimized.

The results of the research in Table 4 show that the Bid Evaluation Stage of the offers has a positive and significant impact on fraud prevention in the procurement of goods and services in Banyuasin Regency ($t=2.244$; Sig. 0.027) and the hypothesis (H_5) is accepted. This finding is supported by the study (Safitri et al., 2024). This significant impact arises because the technical evaluation of the companies takes into account certifications from credible institutions, allowing only companies that meet the standards to qualify. This is closely related to the dimension of competence in Crowe's Fraud Pentagon Theory, where evaluations conducted by actually competent parties can reduce the likelihood of fraud by filtering out unqualified actors. In addition, a strict evaluation stage also reduces the opportunity for fraud as the transparent and structured selection process limits the scope for manipulation. Furthermore, objectively and professionally conducted evaluations can reduce the pressure on perpetrators to commit fraud, as clear standards and strict oversight decrease the urge to deviate. As an additional consequence, the price evaluation in the bidding assessment stage in the Banyuasin Regency should emphasize the alignment of proposals with the criteria set by the committee, rather than focusing solely on the lowest price, to ensure that competence and quality standards take precedence, thereby strengthening comprehensive and sustainable fraud prevention efforts.

In contrast to the previous results, Table 4 shows that the announcement stage has no influence and cannot increase or decrease the prevention of procurement fraud in the Banyuasin Regency ($t=-0.503$; Sig. 0.616), which is why Hypothesis (H_6) is rejected. This finding differs from the study (Safitri et al., 2024). Although the announcement stage is clearly implemented and aims to improve transparency, its effect was not significant as it continues to create opportunity within Crowe's fraud pentagon theory. This opportunity arises when information, even if it is clear, does not reach a sufficiently broad audience. Therefore, the announcement stage in the Banyuasin Regency must expand its reach, for example by disseminating information about potential bidding winners through mass media. This step will strengthen transparency, increase public oversight, minimize potential collusion, and more effectively close the gap for the occurrence of fraud.

As the final stage in the e-procurement process, Table 4 shows that the disclaimer stage has no impact on preventing fraud in the procurement of goods

and services in the Banyuasin Regency ($t=0.617$; Sig. 0.538), therefore the hypothesis (H_7) is rejected. This result differs from the research (Safitri et al., 2024). Although the committee examined every disclaimer to prove its validity, the effect was not significant. This is related to the rationalization dimension in Crowe's fraud pentagon theory, where individuals can justify their actions despite the investigation process. Therefore, the government in the Banyuasin Regency requires strict sanctions as a result, such as disqualifying the winner, canceling the tender, or dissolving the committee if the disclaimer are found to be unfounded. These clear sanctions will undermine the ability of fraudsters to rationalize their actions and significantly reduce the potential for fraud.

Taken together, the seven stages do not each correspond to a single element of Crowe's Fraud Pentagon Theory. Each stage embeds a specific control mechanism, and a mechanism may suppress more than one fraud driver at the same time, while some drivers are addressed by several stages. Forcing a one-to-one correspondence between a stage and a dimension would therefore misrepresent the way the controls operate. Table 5 sets out, for every stage, the control mechanism actually embedded in it, the fraud driver that the mechanism primarily suppresses, the further drivers it also touches, and the empirical result obtained in this study. Read in this way, the three stages that are empirically effective are precisely the stages whose control mechanism acts directly on the decision maker, namely planning, which fixes needs, quality, cost and schedule before any bidder is involved and thereby removes the pressure to accommodate a predetermined supplier; committee formation, which installs officials whose competence and integrity leave no room for the belief that a deviation will pass unnoticed, thereby suppressing arrogance; and bid evaluation, which requires the evaluator to assess administrative, technical and price aspects against pre-set and externally certified criteria, thereby operating through competence. By contrast, the four stages that are not effective share a common characteristic: their control mechanism is documentary and procedural rather than substantive, so it constrains the form of the process without removing the opportunity or the rationalization that remain available to the actor. Prequalification and tender document preparation verify completeness rather than substance, the announcement discloses information to an audience that is too narrow to generate real public oversight, and the disclaimer stage investigates objections without an enforceable sanction attached to the outcome. This reading explains why disclosure and documentation alone do not translate into fraud prevention, and it identifies where the control design has to be strengthened.

Table 5. Mapping of the E-procurement Stages to the Dimensions of Crowe's Fraud Pentagon Theory

Stage	Control mechanism embedded in the stage	Primary dimension suppressed	Other dimensions also addressed	Empirical result in this study
Planning Stage (X_1)	Ex ante determination of needs, quality, cost and schedule in a transparent and accountable manner; splitting of large packages into smaller ones; review of	Pressure	Opportunity; Competence	Significant ($t = 3,611$; Sig. = 0,000); H_1 accepted

Stage	Control mechanism embedded in the stage	Primary dimension suppressed	Other dimensions also addressed	Empirical result in this study
Committee Formations Stage (X ₂)	specifications through internal and public oversight Appointment of committee members on the principles of professionalism, responsiveness, accountability, credibility and independence, supported by training and certification	Arrogance	Competence; Opportunity	Significant (t = 2,073; Sig. = 0,040); H2 accepted
Prequalification Stage (X ₃)	Verification of administrative and technical requirements and of the experience and capability of the prospective provider	Opportunity	Competence	Not significant (t = 1,123; Sig. = 0,264); H3 rejected
Tender Document Preparation Stage (X ₄)	Preparation of documents that conform to the regulations, are simple and transparent, and are reviewed by the authorised parties	Opportunity	Rationalization	Not significant (t = 1,458; Sig. = 0,148); H4 rejected
Bid Evaluation Stage (X ₅)	Administrative, technical and price evaluation against criteria set in advance, using certification issued by credible accreditation bodies	Competence	Opportunity; Pressure	Significant (t = 2,244; Sig. = 0,027); H5 accepted
Announcement Stage (X ₆)	Publication of the tender result in the mass media, clearly, in detail and on time	Opportunity	Rationalization	Not significant (t = -0,503; Sig. = 0,616); H6 rejected
Disclaimer Stage (X ₇)	Openness to objections, publication of objections and responses, investigation of their truth and administrative sanctions for unfounded objections	Rationalization	Opportunity; Arrogance	Not significant (t = 0,617; Sig. = 0,538); H7 rejected

Source: Research Data, 2025

CONCLUSION

This study tested the stages of e-procurement as separate independent variables and therefore makes no claim about an aggregate effect of e-procurement as a single construct. Jointly the stages explain a substantial share of the variation in fraud prevention in the procurement of goods and services in Banyuasin Regency,

but unevenly. Following the order of the hypotheses, the planning stage and the committee formation stage are accepted, the prequalification stage and the tender document preparation stage are rejected, the bid evaluation stage is accepted, and the announcement stage and the disclaimer stage are rejected.

This pattern is systematic. The effective stages embed controls that reach the substance of the decision: planning fixes needs and costs before any bidder appears and so removes pressure, committee formation places accountable officials in charge and so suppresses arrogance, and bid evaluation tests offers against pre-set and externally certified criteria and so works through competence. The ineffective stages share the opposite trait, as their controls are documentary and procedural. Prequalification and tender document preparation verify completeness rather than substance, the announcement reaches an audience too narrow to create genuine oversight, and objections are investigated without an enforceable sanction, so opportunity and rationalization remain intact.

Accordingly, the Banyuasin Regency Government is advised to split large procurement packages into smaller ones, to raise committee competence through training and certification, to evaluate bids on their conformity with the established technical criteria rather than on the lowest price, to verify the track record and technical capability of prospective providers, to have tender documents reviewed by the authorised bodies, to widen the publication of tender results through the mass media, and to enforce firm sanctions when an objection proves unfounded.

The novelty of this study is twofold. It disaggregates e-procurement into its sequential stages and tests each stage as a separate independent variable, whereas earlier work has largely treated e-procurement as one aggregate construct and could not show which part of the cycle prevents fraud. It also uses Crowe's Fraud Pentagon Theory as an explanatory lens rather than a descriptive label, allowing a single stage to address several fraud drivers instead of forcing a one-to-one correspondence.

This study therefore makes three contributions. Theoretically, it shows that the Fraud Pentagon does not operate uniformly across a digital procurement cycle; its explanatory power is concentrated in the stages where control reaches the substance of the decision. Empirically, it shows that transparency delivered through disclosure and documentation does not prevent fraud on its own, but only when it is accompanied by substantive verification, a wider audience for the information published, and sanctions that are actually enforced. Practically, it indicates where a procuring entity should concentrate its limited oversight capacity and where the design of the control itself needs to be rebuilt.

This research focuses only on the stage in the e-procurement process, so other factors that may also influence fraud prevention might not be taken into account. Furthermore, the results of this study may not be fully applicable to all organizations, as the findings are based solely on the sample used in the study.

Further research can expand the scope by adding variables such as the effectiveness of internal audits, whistleblowing systems, internal control systems, the organizational ethics culture, and the role of leadership in fraud prevention. A mixed-methods approach (quantitative and qualitative through interviews with practitioners and auditors) will provide deeper insights. Moreover, comparative

studies in different contexts (e.g., public vs. private sectors or countries with varying levels of corruption) will help generalize the findings.

Researcher's Name / Research Title FA plays a role in data collection, data processing, and drafting the article. ED conducts data analysis and revision - final the article. RW contributes to data processing. All authors have read and approved the manuscript.

The authors state that they have no financial conflicts or personal connections that might affect the results presented in this study.

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