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The influence of the e-catalogue system on fraud prevention in goods and services procurement in the regional government of Mimika Regency

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Abstract
Purpose: This study aims to examine the influence of the e-catalogue system on fraud prevention in the procurement of goods and services within the Mimika Regency government, and to assess how fraud prevention mediates the relationship between e-catalogue implementation and procurement effectiveness.
Research/methodology: A quantitative descriptive and explanatory approach was applied using path analysis. Data were collected through structured questionnaires from 50 purposively selected procurement officers and vendors. Regression and Sobel tests were used to measure direct and indirect effects among variables: e-catalogue implementation, fraud prevention, and procurement effectiveness.
Results: The findings indicate that the implementation of the e-catalogue system has a significant positive effect on fraud prevention but does not directly affect procurement effectiveness. However, fraud prevention significantly influences procurement effectiveness and acts as a mediator in the relationship between e-catalogue use and procurement performance. The model explains 75.5% of the variance in procurement effectiveness.
Conclusions: The implementation of the e-catalogue system significantly enhances fraud prevention in public procurement, reinforcing transparency and reducing irregularities. While it does not directly impact procurement effectiveness, its influence becomes substantial when mediated through strong fraud prevention mechanisms. Thus, digital systems alone are insufficient; effective procurement depends on the integration of technology with robust oversight and institutional integrity.
Limitations: This study is limited to a single regency and relies on self-reported perceptions, which may not capture the full scope of systemic or technical constraints in e-procurement.
Contribution: This research contributes to the literature on digital governance and public procurement by highlighting the strategic role of fraud prevention as a mediating factor. It underscores the need for integrated systems that combine digital tools with robust internal control mechanisms to ensure transparent and effective procurement.
Keywords: *e-Catalog, Effectiveness, Fraud Prevention, Path Analysis, Procurement of Goods and Services*
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1. Introduction

Procurement of Goods and Services is one of the key components in supporting the operational effectiveness of the government and the provision of public services (Ajis, Nugroho, & Eriswanto, 2024). Through good procurement practices, local governments can ensure the availability of essential public needs such as infrastructure, education, and healthcare. With a significant portion of the budget allocated to the procurement of goods and services, this process becomes a crucial element in creating efficient and sustainable development. However, non-transparent procurement can lead to waste, inefficiency, and reduce public trust in the government.

Procurement of goods/services is one of the government activities under the Government Procurement Policy Agency (LKPP) (Prikustiawan, 2023). Accountable procurement of goods and services plays a critical role in promoting transparency, efficiency, and accountability in government (Akbar & Syamsir, 2024), especially in Mimika Regency, which is a strategic area with significant economic potential. Accountability in the procurement of goods and services ensures that public funds managed by the local government are used appropriately and target the right objectives, preventing potential national losses due to misuse or fraud. With good management, the procurement of goods and services can increase public trust in the government, while also promoting sustainable development through more optimal budget allocations.

As a region facing geographical challenges and diverse development needs, Mimika Regency requires a procurement system capable of addressing these complexities. This system must ensure that each procurement process is conducted openly, competitively, and with integrity, minimizing the potential for fraud such as collusion, budget mark-up, or manipulation of tender processes. Accountable procurement also helps create a healthy business climate where both local and national businesses can participate fairly and according to regulations. The application of accountability principles in procurement also serves as an instrument to improve governance (Rosidah, Kesumah, & Rizka, 2023). This is essential to achieving sustainable development goals, both in terms of improving the quality of public services and meeting the needs of the people of Mimika Regency more equitably. Therefore, building accountable procurement is a strategic step in promoting a clean, transparent, and responsible government in Mimika.

Although important, procurement of goods and services at the government level often faces various challenges. One prominent issue is the risk of fraud, such as corruption, collusion, and nepotism in the procurement process. These practices not only harm the country financially but also hinder development goals. Data from various sources show that cases of fraud in procurement of goods and services remain a serious issue in many regions in Indonesia, including at the district level. This indicates the need for more effective solutions to mitigate fraud risks in the procurement process. Problems in procurement, such as corruption, collusion, and nepotism (KKN), remain serious challenges that can harm state finances and hinder the achievement of fair and equitable development (Samudra, Siburian, Hasanah, & Siregar, 2024). Corruption often appears in the form of budget manipulation, bribery, or price inflation (mark-up), causing procurement to be inefficient and the quality of goods/services obtained to be poor. Collusion, which typically involves illegal cooperation between suppliers and procurement officials, often leads to tender setting practices, where the project winner is already determined, thus eliminating the principle of healthy competition.

Nepotism stems from the abuse of power by awarding procurement projects to parties with personal or familial relationships, without considering their competence or eligibility. This not only tarnishes the integrity of the procurement process but also harms those who are competent and entitled to the opportunities. The combination of these KKN problems results in double losses: budget waste and low-quality procurement outcomes, ultimately harming the public, the main beneficiaries. The main causes of these KKN issues include weak oversight systems, lack of transparency in procurement processes, and insufficient strict penalties for violations (Asyujuti et al., 2025). Therefore, preventive and enforcement efforts must be made through the implementation of technology-based systems, such as e-

catalogue, which can create a more transparent, monitored, and less manipulable procurement process by irresponsible individuals (Kesumadewi, 2020).

Procurement corruption is a global issue. According to a report from the United Nations Office on Drugs and Crime (UNODC), procurement corruption results in the loss of national funds by approximately 10-25 percent. Meanwhile, in 2014, the Organisation for Economic Co-operation and Development (OECD) released a report titled "The OECD Foreign Bribery Report," which stated that 57 percent of bribery cases involved public foreign officials to obtain public procurement contracts. The complexity of the procurement process creates an opportunity for perpetrators to take advantage, especially when the implementation is done manually or face-to-face (Abdullah, Lahaling, & Rusmulyadi, 2024). This condition has prompted the discourse of shifting from manual to electronic processes to limit the interaction between parties and prevent corruption (Pitara, Susilo, & Pitoyo, 2017).

Based on this idea, Presidential Regulation No. 54 of 2010 on Government Procurement of Goods/Services was issued. This regulation marked the beginning of electronic procurement implementation, which is now applied in Indonesia. One form of implementation of this regulation, in 2015 the Government Procurement Policy Agency launched the e-purchasing method, where public institutions can directly purchase through electronic catalogs. The e-catalogue system emerged as a significant innovation in the procurement of goods and services to address these problems. As a digital-based platform, e-catalogue allows the procurement process to be more transparent and efficient (Rasji, Novianti, & Nathasya, 2024). With features like open price offers and extensive information access, this system is designed to reduce the opportunities for malpractice, including price manipulation and abuse of authority. The e-catalogue system also helps expedite the procurement process, ensuring that the required goods and services are fulfilled more quickly.

The e-catalogue system is considered an effective solution to address corruption, collusion, and nepotism (KKN) in the procurement of goods and services due to its ability to create a transparent, efficient, and data-driven process. The e-catalogue displays all information about goods and services, including specifications, prices, and providers, available openly and can be accessed by the relevant parties (Malinda & Hardjomuljadi, 2018). This minimizes the opportunities for budget manipulation and price inflation (mark-up) because all transactions are electronically recorded and easily auditable. This transparency also closes the gap for collusion practices, where tender winners are predetermined, as procurement is based on direct choices from a validated catalog. Additionally, the e-catalogue system eliminates the potential for nepotism in procurement because the registered suppliers have undergone a strict independent verification process. This mechanism ensures that only qualified suppliers can offer their products or services, reducing the risk of abuse of authority by certain individuals. This system also reduces direct human involvement in the selection process, which is one of the main triggers for KKN practices.

Another advantage of the e-catalogue system is its efficiency in speeding up the procurement process without compromising accountability (Saidah, Ningtyas, Sari, & Purwoko, 2024). The government can save time and costs by using this system while ensuring that the goods and services obtained meet the needs and available budget. Therefore, the implementation of the e-catalogue system not only helps prevent fraud but also improves the quality of governance in procurement that is cleaner and more professional. According to Salusra Widya, the Secretary General of the Government Procurement Policy Agency (LKPP), the direct payment system or e-purchasing is one of the government's efforts to prevent irregularities and corruption in the procurement of goods/services. In addition, this method is also considered to accelerate the procurement process without neglecting accountability. Efficient, transparent, and well-managed procurement is key to the success of organizations in achieving their goals. In the face of the dynamics of the business environment and advances in information technology, organizations are required to continuously innovate and utilize technology as a tool to increase procurement process efficiency (Haidir & Maliki, 2024).

On the other hand, Ministries/Agencies/Local Governments are also required to use e-purchasing for goods/services that involve fulfilling national and/or strategic needs as determined by the Minister, Head of Agency, or Head of Region. Furthermore, to strengthen the use of e-purchasing, in 2022, the government through LKPP targeted increasing the number of products in the e-catalogue to 1,000,000 (one million), especially domestic products. This is done to make more commodities available, facilitating public institutions in purchasing goods/services. Based on procurement profile data released by LKPP, in the last 3 years, the number of goods/services procured using e-purchasing has averaged 10% of total government procurement. In 2019, there were 347,557 packages with a transaction value of Rp 69.2 trillion, then in 2020, there were 295,532 packages with a value of Rp 49.5 trillion, and in 2021, there were 228,207 packages with a transaction value of Rp 49.7 trillion.

Mimika Regency, as one of the regions with a dynamic economic activity, faces its own challenges in the procurement of goods and services. With a significant budget allocation to support development, the risk of procurement irregularities remains a primary concern. The implementation of the e-catalogue system in Mimika Regency is expected to become a solution to improve transparency and accountability while minimizing the risk of fraud that may occur in the procurement process. With the increasing use of e-purchasing and the absence of studies specifically mapping e-purchasing fraud, this research is relevant for the government to develop systems or policies that can detect fraud in e-purchasing. This research is highly relevant in evaluating the impact of the e-catalogue system on fraud prevention in the procurement of goods and services. The results of this study are expected to make a significant contribution to the improvement of procurement governance in Mimika Regency. Furthermore, this research can serve as a reference for other regions facing similar problems, enabling them to optimize the implementation of the e-catalogue system to create better procurement throughout Indonesia.

2. Literature review

2.1 E-Catalog System

The e-catalog system has both positive and negative impacts. The positive impact includes shopping efficiency, faster procurement of goods and services, and the freedom for users to choose the required goods through the e-catalog. There is also healthy business competition because each provider offers prices openly and transparently (Sihaloho, Ariza, & Munandar, 2024). Before the local e-catalog, local governments had to submit procurement proposals to the central government, which took longer. With the local e-catalog, the time for procurement is shortened and becomes faster (Nafi'ah, 2022). On the other hand, the negative impacts include confusion in price determination, disruption in the supply chain, weakening business turnover in local areas, and the greatest impact is felt by businesses selling Information Technology products (Iqbal, 2020).

2.2 Concept and Principles of Goods and Services Procurement

Procurement of goods and services is a strategic process carried out by organizations, both government and private, to fulfill their operational needs through the purchase or provision of certain goods and services. In the context of government, the procurement of goods and services plays an important role as a key instrument in the use of state budgets to support public services and development (Hardiyan, 2023). This process involves various stages, starting from needs planning, budget preparation, provider procurement, to the execution and monitoring of procurement results. The success of effective procurement depends heavily on the application of established principles to ensure transparency, accountability, and efficiency at each stage.

The principles of procurement of goods and services include several key aspects. Here are the procurement principles that must be met (Syafar & Razak, 2022):

1. Efficient
   Goods and services procurement must be done economically, not wasting resources, and in accordance with the planned needs without reducing quality or the final goals to be achieved.
2. Effective
   The procurement process must be able to produce goods or services that meet the needs, with adequate quality, and have a positive impact on users and society.

3. Transparent
   All stages of procurement must be open, with information easily accessible to the public or relevant parties to ensure that there is no manipulation or deviation in the process.
4. Open
   The procurement process must provide broad and fair opportunities for all goods and services providers who meet the requirements, without discrimination or conflict of interest.
5. Competitive
   Procurement must be conducted with a healthy competition mechanism, where all providers have equal opportunities to participate and compete fairly based on the established criteria.
6. Fair or Non-Discriminatory
   The procurement process must be conducted without giving special treatment to any party, ensuring that all participants are treated equally according to the applicable rules.
7. Accountable
   Every decision and step in the procurement process must be legally, administratively, and morally accountable, both to the public and the supervisory authorities.

These principles are designed to create a procurement system with integrity, ensure the optimal use of public funds, and prevent fraud, abuse, or unethical practices. Therefore, the application of these procurement principles not only serves as technical guidelines but also reflects a commitment to good governance.

2.3 Process of Goods and Services Procurement

The operational principles of the e-catalog, as regulated and applied in practice, include several crucial stages. The e-catalog requires the procurement party to collect product and service information electronically. This involves preparing an electronic catalog that meets the specified criteria and format (Ariza, 2024). The procurement process is then carried out electronically, including provider registration, request for offers, and evaluation of offers. Openness and transparency are key focuses, in line with regulations that emphasize healthy competition in the procurement of goods and services. The e-catalog consists of national, sectoral, and local electronic catalogs (Faniyah, Pratama, & Yendri, 2024). In practice, the e-catalog not only provides efficiency in information access but also ensures system security and reliability. The parties managing the e-catalog are responsible for maintaining data security and integrity, ensuring the trust of all parties involved in the procurement process. Routine evaluation of system performance and updates in accordance with regulations are important steps to maintain the relevance and effectiveness of the e-catalog as technology and user needs evolve. By implementing these principles, the e-catalog not only becomes an efficient tool in procurement but also upholds standards of integrity, transparency, and security in line with applicable regulations..

2.4 Process of Listing Goods and Services in the E-Catalog

Goods/services procurement must be open to providers who meet clear and transparent requirements to create healthy competition (Faujianto, Indrayana, & Rohmatiah, 2023). The urgency of the policy on procurement through the e-purchasing mechanism with the electronic catalog system (e-catalog) is aimed at supporting the procurement process in the era of the Internet of Things to align with the progress of the times (Arifin, Daga, & Anshar, 2023). According to Presidential Regulation No. 16 of 2018 on Government Goods/Services Procurement, Article 72 explains that:

1. The selection of products listed in the electronic catalog is carried out by Ministries/Institutions/Local Governments or LKPP (paragraph 3)
2. The selection of electronic catalog products is done through tender and negotiation methods (paragraph 4). This means that Ministries/Institutions/Local Governments or LKPP can choose products to be listed in the electronic catalog as long as they pass the verification carried out by the LKPP verification team. Additionally, the product selection process in the electronic catalog can be done through two methods: tender or negotiation

2.5 Purchasing Goods/Services with Price Negotiation Method

The Government Procurement Policy Institute is one of the government institutions responsible for handling public affairs (Widhi, 2023). Until now, the electronic catalog system only accommodates purchases through price negotiation and mini-competition methods. The competitive catalog has not been available. In this section, the researcher will focus on examining the potential for fraud in purchasing products/commodities in the electronic catalog that use the price negotiation method. This method requires Ministries/Institutions/Local Governments to negotiate prices before purchasing products. According to the Director of System Development Circular No. 27199/D.2.2/10/2022 on October 25, 2022, it is mentioned that the displayed product price in the electronic catalog is not final and needs price correction/checking through the negotiation process. Generally, for purchases above 200 million IDR, the ordering/package creation is done by PPK. For packages under 200 million IDR, the ordering/package creation is done by PP.

The e-catalog system is a digital platform designed to simplify the procurement of goods and services in an efficient, transparent, and accountable manner. The e-catalog functions as an online directory containing information about goods or services, including specifications, prices, and verified providers. This system allows users, especially government agencies, to place orders directly without going through time-consuming auctions or tenders. This concept aims to reduce potential deviations such as price mark-ups, collusion, and nepotism by providing data that is open and accessible to all relevant parties.

2.6 Comparison of E-Catalog and Non-E-Catalog Systems

1. Time Efficiency: E-catalog enables faster selection and purchasing processes compared to the manual tender system, which requires a lengthy evaluation period.
2. Transparency: E-catalog provides open data that can be accessed by the public, while the manual system tends to be less transparent.
3. Data Security: E-catalog uses a digital system with a clear audit trail, while the manual system is more susceptible to manipulation.
4. Risk of Fraud: The risk of fraud such as price mark-ups, collusion, and nepotism is lower in the e-catalog system due to the presence of standards and automatic monitoring.
5. Flexibility: E-catalog allows users to choose goods/services according to their needs without having to wait for the tender process to complete, while the manual system is more limited in flexibility.

2.7 Definition of Fraud

Fraud is an unlawful act committed by someone within or outside an organization, with the intent of gaining personal or group benefits, directly or indirectly harming other parties. Fraud is a deliberate act by one or more individuals in management or those responsible for governance, employees, and third parties involving deception to gain unfair or illegal benefits (Rozak & Gayah, 2017). Fraud involves obtaining benefits by presenting something that is not in accordance with the actual situation. It includes elements of surprise, trickery, cunning, and dishonesty that harm others. Fraud (fraud) should also be distinguished from errors.

3. Methodology

This study uses a descriptive and explanatory quantitative approach to analyze the impact of the e-catalog system on fraud prevention in the procurement of goods and services in the Mimika Regency Government. This method allows testing causal relationships between the independent variable (implementation of the e-catalog system), the mediating variable (fraud prevention), and the dependent variable (procurement effectiveness). Primary data is obtained through the distribution of structured questionnaires to 50 respondents selected using purposive sampling from a population of 65 procurement officials (PPK and procurement officers) and service providers directly involved in the e-purchasing process. The questionnaire uses a five-point Likert scale to measure perceptions of transparency, efficiency, accountability, and fraud potential.

The data analysis technique used is path analysis to identify both direct and indirect relationships between variables and test for mediation effects. Validity and reliability tests are conducted to ensure the quality of the instruments. Data processing is performed using statistical software to generate accurate, measurable, and reliable analysis results. This study also refers to good governance theory and the principles of efficient, transparent, and accountable government procurement. With this approach, the study is expected to contribute to efforts to improve public procurement governance that is clean and free from fraudulent practices.

4. Results and discussions

4.1 Research Results

4.1.1 Descriptive Statistical Analysis

This analysis serves to describe the basic characteristics of the collected data, such as the respondent profile (age, gender, education, work experience), and an overview of respondents' responses to the research variables (Implementation of E-Catalog, Fraud Prevention, Procurement Effectiveness). This analysis does not aim to make general conclusions but provides an initial understanding of the data.

1) Data Quality Test (Validity and Reliability):

The validity test ensures that each item (question) in the questionnaire truly measures the concept or variable it is intended to measure. This is essential for ensuring that the measurement tools used are accurate. The reliability test measures how consistent or stable the questionnaire results are when measurements are repeated at different times or under different conditions. A reliable instrument provides trustworthy data.

4.1.2 Stage I Regression Analysis

his analysis aims to measure and test the influence (causal relationship) between one or more independent variables on one dependent variable. Stage I (Simple Regression) analyzes the direct effect of the implementation of the E-Catalog (EC) on Fraud Prevention (FP).

The first stage of path analysis is conducted to determine the effect of the e-catalog implementation (EC) on fraud prevention (FP). This analysis is carried out using simple linear regression with the help of SPSS software. The results of this analysis will form the basis for examining the direct influence of the independent variable on the first dependent variable before moving on to the next analysis stage. Detailed information regarding the regression coefficient values, significance, and strength of relationships is presented in the analysis results table, which will be discussed further in the next section.

Table 1. Stage I Regression Analysis Results

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	12.346	8.010		1.541	.134
	E-Catalogue System(EC)	.685	.186	.571	3.684	.001
a. Dependent Variable: Fraud Prevention (FP)						

Source: Processed Data (2025)

Based on the regression analysis results, the regression equation that describes the effect of the implementation of the E-Catalogue System (EC) on Fraud Prevention (FP) is as follows:

PF=12.346+ 0.685EC

From the equation above, it can be concluded that when the E-Catalogue System (EC) increases by one unit, Fraud Prevention (FP) will increase by 0.685, assuming all other factors remain constant. The constant value of 12.346 indicates that Fraud Prevention (FP) will have a baseline value of 12.346 when the E-Catalogue System (EC) is not implemented (zero). The significance test result shows that the

coefficient for the implementation of the E-Catalogue System (EC) has a p-value of 0.001, which is smaller than the significance value of 0.05. This indicates that the effect of the implementation of the E-Catalogue System (EC) on Fraud Prevention (FP) is significant. Thus, it can be concluded that the implementation of the e-catalogue system contributes positively to fraud prevention efforts in the organization being studied.

Further, the partial determination coefficient value (Standardized Beta Coefficient = 0.571) also shows that the contribution of EC to FP is strong and relevant, making EC an important predictor in this model. This suggests that organizations implementing the e-catalogue system more maximally have a higher chance of reducing fraud potential in procurement. In other words, the implementation of EC is not only a technological innovation but also an instrument to strengthen effective governance in support of good governance principles, particularly in transparency and accountability.

4.1.3 Stage II Regression Analysis

Stage II (Multiple Regression) analyzes the effect of the implementation of the e-catalog (EC) and fraud prevention (FP) together on the Effectiveness of Procurement of Goods and Services (BJ). In the second stage of regression analysis, multiple regression is performed to test the influence of the implementation of the E-Catalogue System (EC) and Fraud Prevention (FP) on the Effectiveness of Procurement of Goods and Services (BJ). The purpose of this multiple regression analysis is to determine whether these two independent variables, EC and FP, simultaneously affect the dependent variable BJ. The results of this multiple regression analysis will provide information on the contribution of each independent variable to the Effectiveness of Procurement of Goods and Services (BJ), as well as the significance level of the relationship. By combining these two independent variables in one model, it is expected to more accurately depict the complex and realistic factors affecting procurement effectiveness. The results of the second-stage regression analysis are shown in the table below.

Table 2. Stage II Regression Analysis Results

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	14.248	5.012		2.843	.008
	E-Catalogue System(EC)	.086	.136	.089	.630	.534
	Fraud Prevention (FP)	.596	.114	.743	5.248	.000
a. Dependent Variable: Procurement Effectiveness (BJ)						

Source: Processed Data (2025)

Based on the results of the second-stage regression analysis involving the two independent variables, the E-Catalogue System (EC) and Fraud Prevention (FP) on the dependent variable Effectiveness of Procurement of Goods and Services (BJ), the multiple linear regression equation is as follows:

$$BJ = 14{,}248+0{,}086EC+0{,}596PF$$

From the equation above, it can be explained that the constant value of 14.248 indicates that when both EC and FP are zero, the effectiveness of procurement is predicted to be 14.248. The regression coefficient for the E-Catalogue System (EC) is 0.086, which shows a positive but insignificant effect on the Effectiveness of Procurement of Goods and Services (BJ) because the significance value is 0.534 (greater than 0.05). This means that increasing the implementation of the e-catalogue does not significantly affect the effectiveness of procurement.

On the other hand, the Fraud Prevention (FP) variable has a regression coefficient of 0.596 with a significance value of 0.000 (less than 0.05), meaning that FP has a positive and significant effect on the Effectiveness of Procurement of Goods and Services (BJ). This indicates that the higher the fraud prevention efforts, the higher the effectiveness of the procurement process. This result emphasizes the importance of integrity and control in procurement, showing that procurement success is more determined by fraud prevention mechanisms than by digital systems such as e-catalogue..

4.1.4 Path Analysis

Path analysis serves to test a more complex causal relationship model between variables, including measuring both direct and indirect effects. In this study, path analysis is used to examine how EC affects BJ, both directly and indirectly through PF as a mediating variable. After testing the validity and reliability of the instruments and conducting descriptive analysis of the variables, the next step in this research is to test the structural model through path analysis. This model is used to determine the direct and indirect effects between variables defined in the research framework. In this case, the E-Catalogue System (EC) variable serves as the independent variable (X), Fraud Prevention (FP) as the first dependent variable (Y1), and Procurement Effectiveness (BJ) as the second dependent variable (Y2).

This structural model aims to measure the extent of each variable's contribution to influencing other variables, both directly and through the mediating variable. The results of the path analysis will provide a comprehensive overview of the causal relationships between variables and test the hypotheses formulated in the research. The structural model in this study is illustrated as follows.

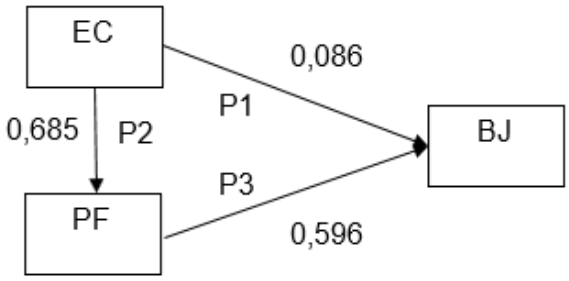

Figure 1. Path Analysis Model

The interpretation of each path can be outlined as follows:

1. The direct effect of EC on PF has a path coefficient of 0.685
2. The direct effect of EC on BJ has a path coefficient of 0.086
3. The direct effect of PF on BJ has a path coefficient of 0.596
4. The indirect effect of EC on BJ through PF is 0.685 x 0.596 = 0.408
5. The total effect of EC on BJ through PF is 0.086 + 0.408 = 0.494

4.1.5 F-Test

The F-test or simultaneous test is used to determine whether the independent variables together (simultaneously) have a significant effect on the dependent variable in the regression model. This test is important to ensure that the overall model can be used to explain the relationships between the variables being studied. In this research, the F-test is conducted to assess whether the E-Catalogue System (EC) and Fraud Prevention (FP) variables simultaneously affect Procurement Effectiveness (BJ). The results of the F-test analysis can be seen in the table below.

Table 3. F-Test Results

Model		*Sum of Squares*	*df*	*Mean Square*	*F*	*Sig.*
1	Regression	340.236	2	170.118	23.539	.000[b]
	Residual	195.131	27	7.227		
	Total	535.367	29			
a. Dependent Variable: Procurement Effectiveness (BJ)						
b. Predictors: (Constant), Fraud Prevention (FP), E-Catalogue System(EC)						

Source: Processed Data (2025)

Based on the F-test results in the table above, the F value is 23.539 with a significance of 0.000. Since the significance value is less than 0.05, it can be concluded that the regression model built, which includes the E-Catalogue System (EC) and Fraud Prevention (FP) variables, significantly affects the

Procurement Effectiveness (BJ) variable. Therefore, the regression model used in this study is appropriate for explaining the relationships between the variables..

4.1.6 T- Test (Partial Test)

The t-test or partial test is used to examine the significance of each independent variable's effect individually (partially) on the dependent variable, while controlling for other independent variables in the model. This test helps to identify which independent variables statistically significantly affect the dependent variable. After conducting the F-test to determine the simultaneous effects of the independent variables on the dependent variable, the next step is to perform the t-test to determine the partial effect of each independent variable on the dependent variable. The purpose of this t-test is to identify the contribution of each independent variable, namely the E-Catalogue System (EC) and Fraud Prevention (FP), individually to the Procurement Effectiveness (BJ) variable. The testing results can be seen in Table 5.2. previously. The results of the partial effect analysis are as follows.

1. Effect of E-Catalogue System (EC) on Procurement Effectiveness (BJ): The t-test results show that the E-Catalogue System (EC) variable has a regression coefficient of 0.086, with a t-value of 0.630 and a significance (Sig.) value of 0.534. Since the significance value is greater than 0.05, it can be concluded that the EC variable does not significantly affect the Procurement Effectiveness (BJ). This means that the E-Catalogue System, on its own, is not strong enough to increase procurement effectiveness if not accompanied by other factors.
2. Effect of Fraud Prevention (FP) on Procurement Effectiveness (BJ): Meanwhile, the Fraud Prevention (FP) variable shows a regression coefficient of 0.596, with a t-value of 5.248 and a significance value of 0.000. Since the significance value is less than 0.05, it can be concluded that the FP variable significantly affects the Procurement Effectiveness (BJ). This shows that the better the fraud prevention efforts, the higher the effectiveness of the procurement process

Further, the partial standardized coefficient (Beta Standardized Coefficient = 0.571) also indicates that the contribution of EC to PF is strong and relevant, making EC an important predictor in this model. This implies that organizations that more fully implement the e-catalogue system have a higher chance of reducing fraud potential in procurement. In other words, the implementation of EC is not just a technological innovation, but also an instrument to strengthen effective governance that supports good governance principles, particularly in transparency and accountability. Other variables outside the model also contribute to the dependent variable. The explanation of the determination test is as follows..

1) Determination Coefficient of Stage I Regression Analysis

Stage I regression explains the effect of EC on PF, as seen in the following table.

Table 4. Determination Coefficient of Stage I Regression Analysis

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.571[a]	.326	.302	4.474
a. Predictors: (Constant), E-Catalogue System(EC)				

Source: Processed Data (2025)

Based on the regression analysis results in the first model, the determination coefficient (R Square) is 0.326. This means that 32.6% of the variation in the Fraud Prevention (FP) variable can be explained by the independent variable, the E-Catalogue System (EC). Meanwhile, the remaining 67.4% is influenced by other factors outside the model that were not investigated in this study. This shows that although the implementation of the e-catalogue plays a role in improving fraud prevention, there are still external factors that influence the effectiveness of these efforts and need to be considered in the development of procurement policies.

2) Determination Coefficient of Stage II Regression Analysis

Stage II regression explains the effect of EC on PF. The results of the determination test can be seen in the following table.

Table 5. Determination Coefficient of Stage II Regression Analysis

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.797[a]	.636	.609	2.688
a. Predictors: (Constant), Fraud Prevention (FP), E-Catalogue System(EC)				

Source: Processed Data (2025)

Based on the regression analysis results in the second model, the determination coefficient (R Square) is 0.636. This indicates that 63.6% of the variation in the Procurement Effectiveness (BJ) variable can be explained by the two independent variables, E-Catalogue System (EC) and Fraud Prevention (FP). The remaining 36.4% is influenced by factors not included in this model. The Adjusted R Square value of 0.609 also indicates that this model is quite good at explaining the relationship between the variables studied, considering the number of variables used. These results confirm that both the implementation of the e-catalogue system and fraud prevention efforts significantly contribute to improving the effectiveness of procurement in the studied area.

3) Total Determination Coefficient

For the total determination coefficient of the relationship between variables, the effect of errors ε1 and ε2 needs to be calculated as follows.

a. Calculation of ε1

R^2 of Stage I regression = 0,326

$$\boldsymbol{\varepsilon 1 = \sqrt{1 - 0,326}}$$

ε1 = 0,821

b. a. Calculation of ε2

R^2 of Stage II regression = 0,636

$$\boldsymbol{\varepsilon 1 = \sqrt{1 - 0,636}}$$

ε1 = 0,603

The total variance in the data explained by the structural model can be measured with the following equation:

$R^2m = 1- Pe1^2. Pe2^2 ... Pem^2$

The interpretation of this model is as follow.

$R^2m = 1- (0,821)^2.(0,603)^2$

$R^2m = 1- (0,674) (0,364)$

$R^2m = 1- 0,245$

$R^2m = 0,755$

From this calculation, we know that R2m is 0.755. This means that the variance in the data explained by this model is 75.5%. In other words, the model can explain 75.5% of the phenomena under study, while the remaining 24.5% is explained by other variables outside the model.

4.1.7 Sobel Test

The Sobel Test specifically tests the significance of the indirect (mediated) effect of an independent variable on a dependent variable through a mediating variable. In this context, it is used to determine whether FP significantly mediates the relationship between EC and BJ. In this study, the Sobel Test is employed to assess the significance of the indirect effect of the independent variable on the dependent variable through the mediating variable. The test aims to determine whether the mediating variable plays a significant role in bridging the relationship between the independent and dependent variables. In this analysis, the E-Catalogue System (EC) acts as the independent variable, Fraud Prevention (FP) as the mediating variable, and Procurement Effectiveness (BJ) as the dependent variable. The calculation is done using the Sobel formula, which considers the regression coefficients and standard

errors of each path. The results of this test will provide information on the strength and significance of the indirect effect occurring through the mediation mechanism. The Sobel test calculations are detailed as follows

1) Calculation of SP2P3
The calculation for SP2P3 is as follows.

$$\mathbf{SP2P3} = \sqrt{\mathbf{P3^2SP2^2 + P2^2SP3^2 + SP2^2SP3^2}}$$
$$\mathbf{SP2P3} = \sqrt{\mathbf{0,596^2.0,186^2 + 0,685^2.0,114^2 + 0,186^20,114^2}}$$
$$\mathbf{SP2P3} = \sqrt{\mathbf{0,355.0,035 + 0,469.0,013 + 0,035.0,013}}$$
$$\mathbf{SP2P3} = \sqrt{\mathbf{0,012 + 0,006 + 0,000455}}$$
$$\mathbf{SP2P3} = \sqrt{\mathbf{0,018455}}$$
$$\mathbf{SP2P3 = 0,136}$$

2) Calculation of Z Statistic
The Z statistic is calculated as follows.

$$\mathbf{Z} = \frac{\mathbf{P2P3}}{\mathbf{SP2P3}}$$
$$\mathbf{Z} = \frac{\mathbf{0,865.0,596}}{\mathbf{0,136}}$$
$$\mathbf{Z} = \frac{\mathbf{0,51554}}{\mathbf{0,136}}$$
$$\mathbf{Z = 3,791}$$

3) Interpretation of Results
Based on the Sobel test calculation, the Z value obtained is 3.291, which significantly exceeds the Z Table value at the 5% significance level (α = 0.05), which is 1.96. This Z value indicates that the mediating effect of Fraud Prevention (FP) in the relationship between the E-Catalogue System (EC) and Procurement Effectiveness (BJ) is statistically significant. In other words, the FP variable effectively mediates the effect of EC on BJ, and thus the presence of FP in the path model is crucial and cannot be ignored. This finding strengthens the argument that the implementation of the e-catalogue system has not only a direct impact but also an indirect role in enhancing procurement effectiveness through fraud prevention mechanisms. Substantively, this indicates that the better the implementation of the e-catalogue, the higher the fraud prevention efforts, which in turn positively impacts efficiency, transparency, and accountability in the procurement process.

4.1.8 Hypothesis Testing Results

Based on all the path analysis testing results, the hypothesis testing results of this study are as follows:

1. There is a significant effect between the E-Catalogue System (EC) and Fraud Prevention (FP), with a significance value of 0.001 ($p < 0.05$).
2. There is no significant effect between EC and Procurement Effectiveness (BJ), with a significance value of 0.534 ($p > 0.05$).
3. There is a significant effect between FP and BJ, with a significance value of 0.000 ($p < 0.05$).
4. Simultaneously, EC and FP significantly affect BJ, with an F value of 23.539 and a significance of 0.000 ($p < 0.05$).
5. FP significantly mediates the effect of EC on BJ, proven through the Sobel test with a Z value of 3.291 ($Z > 1.96$)

4.2 Discussion

This study aims to analyze in-depth the relationship between the implementation of the e-catalogue system, fraud prevention, and procurement effectiveness within the scope of the Mimika Regency government. These three variables were chosen based on the urgency of improving the governance of public procurement to be clean, efficient, and accountable. In the context of regional autonomy and

fiscal decentralization, the main challenge in public procurement is how the system can prevent fraud while ensuring the efficiency of public spending. Therefore, the results of this hypothesis testing become an important foundation for strengthening procurement reform policies in the region, specifically in Mimika Regency.

The results of the first stage testing show that there is a significant effect of the E-Catalogue System on fraud prevention efforts. This indicates that the more optimal the use of the e-catalogue system in the procurement process, the higher the effectiveness of reducing the potential for fraudulent practices. In the case of Mimika Regency, digitalization through the e-catalogue provides easy access to information, price transparency, and standardization of goods/services specifications, making the room for data manipulation and procurement fraud narrower. These results align with the theory of internal control and good governance, where an open and well-documented system creates more effective controls over deviations. This finding also strengthens previous research stating that the adoption of information technology in the procurement system significantly reduces the opportunities for fraud.

The second-stage analysis proves that fraud prevention significantly affects the effectiveness of procurement of goods and services. This means that the better the fraud prevention efforts made by procurement officials in Mimika Regency, the more effective the procurement process will be in terms of timeliness, quality, and budget efficiency. Fraud prevention is not only related to law enforcement but also includes the integrity of the process, the competence of procurement officers, and the multi-layered supervision conducted by the relevant institutions. In Mimika Regency, strengthening the role of the inspectorate and other internal supervisory institutions is crucial in supporting procurement effectiveness. This finding is consistent with the theory of managerial control, which states that control over behavior and processes is a determining factor in the success of public organizations in achieving efficiency and performance effectiveness.

On the other hand, the direct relationship between the E-Catalogue System and the effectiveness of procurement of goods and services does not show a significant effect. This indicates that the digitalization of the procurement system does not automatically improve procurement effectiveness if not accompanied by strong supervision and fraud prevention commitments. In other words, the system is just a tool, while success depends on the people and institutions managing it. In the case of Mimika Regency, although the e-catalogue system has been officially used, its implementation still faces challenges in technical and administrative aspects, such as limited internet access in certain areas, lack of understanding among human resources, and resistance to change. Therefore, this result emphasizes the importance of strengthening institutional capacity and reforming the work culture within the procurement bureaucracy.

The mediation test using the Sobel test shows that fraud prevention significantly mediates the relationship between the E-Catalogue System and procurement effectiveness. This finding contributes significantly to both theoretical and practical frameworks. Theoretically, it supports the integrative model where technology and risk management cannot be separated in modern public procurement systems. The e-catalogue system does not immediately improve procurement output without a clean work culture and accountability. Practically, this means that strengthening internal controls and monitoring for fraud potential is key to optimizing the benefits of the digital procurement system. In the context of government procurement implementation in Mimika Regency, the dynamics between the digital system implementation, fraud prevention strategies, and procurement effectiveness form a complex ecosystem. The designed structural model shows the connection between digitalization as a modern policy intervention and the strategic role of fraud prevention, which ultimately impacts the efficiency and success of procurement processes at the regional level.

From the path analysis results, an important finding emerged regarding the relationship pattern between the three main variables. The E-Catalogue System has a significant direct effect on fraud prevention. This finding shows that the higher the level of adoption and utilization of the e-catalogue system, the stronger the fraud prevention mechanisms in procurement processes. In Mimika Regency, the

implementation of this system is driven as part of digital bureaucratic reform and transparency, in line with the central government's efforts to strengthen e-government systems. The e-catalogue system functions not only as an administrative tool but also as an internal control instrument that can close loopholes for corruption, especially in the selection and procurement of goods/services.

Furthermore, fraud prevention has proven to be a significant determinant of the effectiveness of procurement of goods and services. This means that the stronger the fraud prevention system applied, the higher the likelihood that procurement will be carried out optimally, on time, of good quality, and with the right target. In the framework of good governance theory, fraud prevention efforts reflect the principles of integrity and public accountability. Mimika Regency, which has its own geographical and demographic challenges, requires a system-based fraud prevention approach, not just relying on individual controls. Strengthening a culture of integrity through an integrated system becomes the foundation for creating procurement processes that are not only administratively efficient but also ethically clean.

However, when looking at the direct relationship between the E-Catalogue System and the effectiveness of procurement of goods and services, the research results show that its direct effect is not significant. This indicates that although the digitalization of the procurement process provides a framework of transparency and efficiency, the success of procurement is not solely determined by the adoption of digital systems. In practice, other factors such as human resource capacity, network and technology infrastructure availability, and the quality of internal supervision play a moderating role in determining final effectiveness. Therefore, the role of the e-catalogue system is stronger when mediated by success in fraud prevention, rather than as an independent factor. These results are consistent with public procurement management theories that emphasize technology as an enabler, not a sole solution. Digital literacy and systemic monitoring are essential components to ensure that system implementation truly leads to a positive impact on procurement goals. In the context of Mimika, challenges such as accessibility to remote areas, limited technical capacity of civil servants, and resistance to change also contribute to the non-significant direct effect of the e-catalogue on procurement effectiveness.

The findings from the mediation test reinforce this argument. There is a significant indirect effect from the E-Catalogue System on the effectiveness of procurement of goods and services through the fraud prevention variable. This means that the digital system contributes greatly to procurement success if it is internalized within fraud prevention mechanisms. In other words, the e-catalogue system acts as a catalyst that strengthens internal control instruments, reducing the potential for deviation at every stage of procurement. Procurement effectiveness then becomes the final output of a clean, transparent, and accountable process. From a regional policy perspective, these results are important for redesigning the procurement approach that not only emphasizes technology-based systems but also underscores the importance of monitoring and fraud prevention systems integrated into the procurement cycle. Mimika Regency needs to strengthen the synergy between the e-catalogue system and internal monitoring systems so that digitalization does not merely become an administrative formality but truly serves as an effective control mechanism.

5. Conclusions

An accountable procurement process is one that is conducted openly, is accountable, and in compliance with legal provisions and good public financial management principles. Accountability in procurement means that every stage, decision, and use of the budget must be auditable and explained transparently to interested parties, especially the public and supervisory bodies. By implementing the e-catalogue system in the provider selection mechanism, this can be realized.

The E-Catalogue System has a positive and significant effect on fraud prevention, which indicates that the digitalization of the procurement process can strengthen transparency and reduce opportunities for fraud in the procurement of goods and services. Fraud prevention has a positive and significant effect on procurement effectiveness, signaling that the success of procurement highly depends on systematic efforts to prevent fraud at every stage of the process.

The E-Catalogue System does not have a direct significant effect on procurement effectiveness, which indicates that the existence of a digital system alone is not enough to guarantee procurement success without strong internal controls. The E-Catalogue System has an indirect effect on procurement effectiveness through fraud prevention as a mediating variable, showing the importance of integrating digital systems and monitoring strategies in achieving effective procurement. The relationship model between variables in this study has been proven to be significant simultaneously, reinforcing that the combination of electronic procurement systems and fraud control policies is the main foundation for creating transparent, accountable, and effective procurement in local government environments.

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