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The Influence of E-procurement and Artificial Intelligence on Fraud Prevention at PT Brinks Solution Indonesia

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Keywords: fraud, e-procurement, artificial intelligence, internal control.

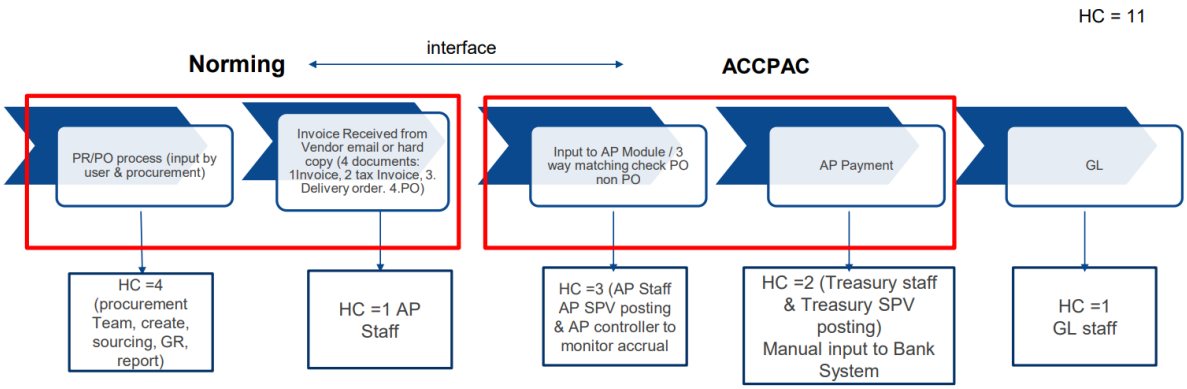
ABSTRACT

PT Brinks Solution Indonesia has implemented an e-procurement system with artificial intelligence to struggle with fraud in end-to-end processes starting procurement to payment. The purpose of this research is to examine e-procurement to reduce fraud. This research uses a quantitative approach by distributing questionnaires to 100 employees, with different ages and functions. The main finding suggests e-procurement system has a positive relationship and is significant to fraud prevention and the emerging expectation to eradicate fraud in the procurement process. The research gives knowledge to the stakeholders to use e-procurement in all procurement to payment processes to prevent fraud.

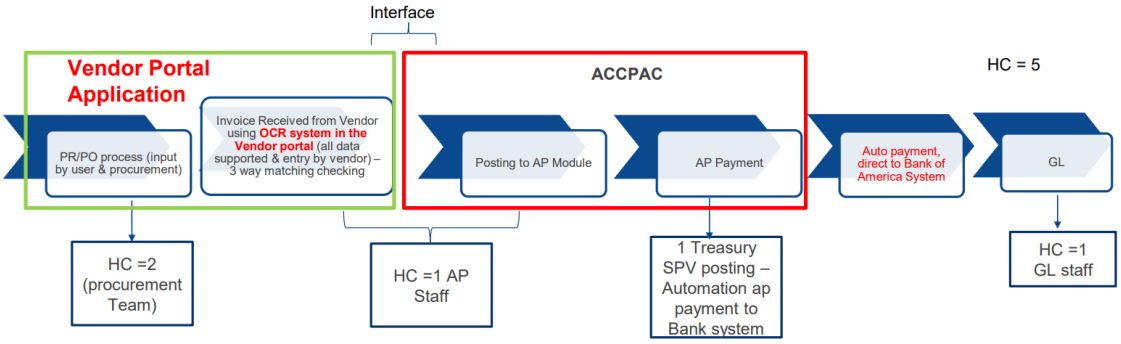
Introduction

Information technology has changed the behavior of institutions in buying and selling goods and services rapidly. In the digital era, PT Brinks Solution Indonesia has adopted technology for many purposes including procurement and payment processes. E-procurement is an online system that can simplify the procurement process (Rotchanakitumnuai, 2013). The potential benefits of e-procurement are greater transparency and increased accountability and reduce the risk of corruption (Neupane et al., 2014). Pt Brinks Solution Indonesia has implemented the Hasmicro system, a national e-procurement system to store and send goods and services electronically. The goal is to increase effectiveness, transparency, and accountability, and the procurement process is accessible to all stakeholders (Amalia et al., 2023).

Previous Process



New Process



However, there are cases of corruption that occur in the procurement process. And certainly cause losses to the Company. Research on e-procurement has not been carried out at PT Brinks Solution Indonesia so the implementation of e-procurement is visible but not accountable (Rae & Subramaniam, 2008). This provides an opportunity to commit fraud such as corruption and bribery, because the e-procurement system is not implemented effectively. Therefore, internal audits and internal controls are necessary to complement fraud prevention. Internal audits are established to monitor organizational activities and control irregular actions (Zakaria et al., 2016). Internal controls ensure that the procurement process is carried out according to the Company's procedures. Therefore, research is needed to measure the effectiveness of E-Procurement and Internal audit on fraud prevention (Bertot et al., 2010).

The purpose of the research is to be able to help companies assess the performance of the system that has been implemented and whether it has been effectively and efficiently used in fraud prevention.

Method

This study uses a quantitative approach to explore the potential of e-procurement systems, internal controls, and artificial intelligence in reducing corruption in the procurement process until the payer. A survey was used to collect data using questionnaires distributed to participants. To select participants, a convenience sample design is adopted. The participants were employees of PT Brinks Solution Indonesia who were involved with different processes and functions. A total of 100 paper-based questionnaires were distributed. The collected data was analyzed using smartPLS. Measurements will be carried out on a scale of 1-6, where 1=strongly disagree and 6=strongly agree.

Results and Discussion

Validity Test

The validity test is carried out to determine how valid or appropriate a questionnaire is in measuring the variables to be studied. This study conducted a validity test on 80 employees of PT Brinks Solution Indonesia by comparing the calculated r value and the table r value. The r-value of the table was obtained based on the degree of freedom (df) = n-k with alpha 0.05 (5%), where 80-2 or df = 78, and the r-value of the table was obtained at 0.219.

Independent E-procurement Variable Validity Test

The results of the validity test of the E-procurement variable are presented in the following table:

Table 1
Results of the Validity Test of the E-Procurement Variable

Variable	Statement Items	r calculate	r Table	Information
E-procurement (X1)	X1.1	0.900	0.219	Valid
	X1.2	0.894	0.219	Valid
	X1.3	0.799	0.219	Valid
	X1.4	0.875	0.219	Valid
	X1.5	0.842	0.219	Valid

Table 1 above, shows that the value of r calculated on 5 statement items in the independent variable E-procurement> from the r table is 0.219 and has a positive value, so it is concluded that the statement item of the independent variable E-procurement is declared valid.

Internal Control Independent Variable Validity Test

The results of the validity test of the internal control variables are presented in the following table:

Table 2
Results of the Validity Test of Internal Control Variables

Variable	Statement Items	r calculate	r Table	Information

Internal Control (X2)	X2.1	0.701	0.219	Valid
	X2.2	0.823	0.219	Valid
	X2.3	0.862	0.219	Valid
	X2.4	0.832	0.219	Valid
	X2.5	0.891	0.219	Valid
	X2.6	0.855	0.219	Valid

Based on Table 2, the value of r calculated on 6 statement items in the internal control variable > from the r of the table is 0.219 and has a positive value, so it is concluded that the statement items of the independent internal control variable are declared valid.

Artificial Intelligent Independent Variable Validity Test

The results of the validity test of artificial intelligence variables are presented in the following table:

Table 3
Results of Artificial Intelligence Variable Validity Test

Variable	Statement Items	r calculate	r Table	Information
Artificial Intelligent (X3)	X3.1	0.901	0.219	Valid
	X3.2	0.901	0.219	Valid
	X3.3	0.896	0.219	Valid
	X3.4	0.906	0.219	Valid
	X3.5	0.769	0.219	Valid

Based on Table 3, it is known that the value of r calculated on 5 statement items in the artificial intelligence variable > from the r of the table is 0.219 and has a positive value, so it is concluded that the statement item of the artificial intelligence independent variable is declared valid.

Validity Test of Dependent Variables of Fraud Prevention

The validity test of the dependent variable fraud prevention is presented in the following table.

Table 4
Results of the Validity Test of Fraud Prevention Variables

Variable	Statement Items	r calculate	r Table	Information
Fraud prevention (Y)	Y.1	0.654	0.219	Valid
	Y.2	0.652	0.219	Valid
	Y.3	0.671	0.219	Valid
	Y.4	0.606	0.219	Valid
	Y.5	0.657	0.219	Valid
	Y.6	0.602	0.219	Valid

The results of the validity test in Table 4, show that the value of r calculation in 6 items of the statement of the fraud prevention variable has a value of r calculation > from the r of the table of 0.219 and a positive value, so that it is concluded that the statement item of the dependent variable fraud prevention is declared valid.

Reliability Test

The reliability test was carried out to measure the level of reliability or consistency of respondents' answers to the questions in the questionnaire. The variable is said to be reliable if it gives a Cronbach Alpha value > 0.60. The results of the reliability test are presented in the following table:

Table 5
Instrument Reliability Test Results

Variable	Cronbach Alpha	Alpha Value	Information
E-procurement (X1)	0.906	0.60	Reliable
Internal control (X2)	0.908	0.60	Reliable
Artificial intelligent (X3)	0.923	0.60	Reliable
Fraud prevention (Y)	0.669	0.60	Reliable

The results of the reliability test in Table 4.5 show that the Cronbach alpha value of the independent variables E-procurement, internal control, and artificial intelligence as well as the dependent variable fraud prevention has a Cronbach alpha value of > 0.60. This means that the three independent variables and dependent variables used are declared reliable.

Classical Assumption Test

Normality Test

According to (Ghozali, 2016), the normality test aims to test whether, in the regression model, the perturbating or residual variable has a normal distribution. The normality test of the study was carried out using graph analysis which was detected by looking at the spread of data (points) on the diagonal joints of the graph or the histogram of the residual (Manjah et al., 2019). The results of the normality test of the histogram and P-plot chart analysis are presented in the following figure:

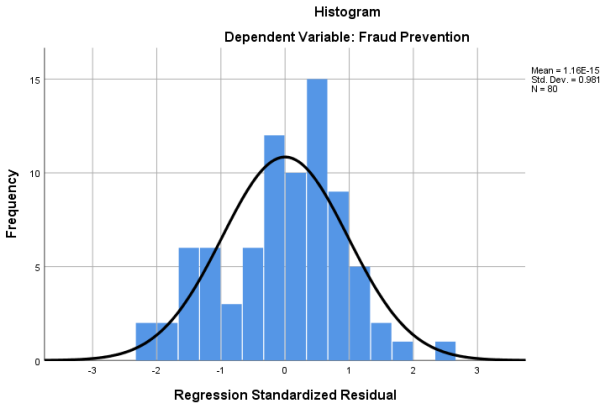


Figure 1 Histogram Chart

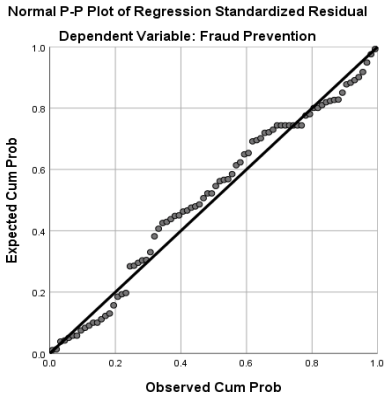


Figure 2 Normal Probability Plot

The results of Figure 1, show that the histogram graph gives a distribution pattern that deviates to the right, meaning that the data is normally distributed, while Figure 2 shows a p-plot graph showing points following and spreading around the diagonal line and following the direction of the diagonal line, so it is concluded that the regression model meets the assumption of normalit (Joseph et al., 2015). In addition to the histogram and p-plot graph tests, this study also conducted a Kolmogorov-Smirnov One-sample test with the following test criteria:

a. The data is normally distributed, if the sig value > alpha level of 0.05 or
b. The data is not normally distributed, if the sig value < alpha level 0.05.

The Kolmogorov-Smirnov test One-sample test is presented in the following table:

Table 6
Results of the One-Sample Kolmogorov-Smirnov Test

One-Sample Kolmogorov-Smirnov Test

		Unstandardized Residual
N		80
Normal Parameters[a,b]	Mean	.0000000
	Std. Deviation	2.20368959
Most Extreme Differences	Absolute	.086
	Positive	.062
	Negative	-.086
Test Statistic		.086
Asymp. Sig. (2-tailed)		.200[c,d]

a. Test distribution is Normal.
b. Calculated from data.
c. Lilliefors Significance Correction.
d. This is a lower bound of the true significance.

The results of the normality test in Table 6, show the Asymp value. Sig. (2-tailed) > 0.05, which is 0.200 > 0.05, so it is concluded that the residuals in the study have been distributed normally (Tong et al., 2014).

Multiple Regression Analysis

Multiple regression analysis was carried out to determine the relationship between independent variables E-procurement, internal control, and artificial intelligence to the dependent variable of fraud prevention in 80 employees of PT Brinks Solution Indonesia. Hasillregression in the study is presented in the following regression table 7:

Table 7
Multiple Regression Results

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	6.606	2.044		3.231	.002
	E Procurement	.334	.088	.344	3.790	.000
	Internal Control	.263	.072	.313	3.669	.000
	Artificial Intelligence	.281	.094	.294	2.977	.004

a. Dependent Variable: Fraud Prevention

The regression results in Table 4.9 show the model of multiple regression equations in the study as follows:

$$Y = a + b1X1 + b2X2 + b3X3 + e$$

Fraud perevention = 6.606 + 0.334 E procurement + 0.263 Internal control + 0.281 Artificial intelligence, The above equation means that:

1. A constant of 6,609 indicates that if the E-procurement, internal control, and artificial intelligence variables are 0 (unchanged), then PT Brinks Solution Indonesia's fraud prevention will have a value of 6,609.
2. The regression coefficient of the E-procurement variable (X1) of 0.334 shows a positive direction. This means that E-procurement has a positive relationship with event fraud, where every increase in E-procurement is 1 percent while other independent variables are fixed, then PT Brinks Solution Indonesia's event fraud will experience an increase of 33.4 percent.
3. The regression coefficient of the internal control variable (X2) of 0.263 indicates a positive direction. This means that internal control has a positive relationship with event fraud, where every increase in internal control is 1 percent while other independent variables are fixed, then PT Brinks Solution Indonesia's event fraud will experience an increase of 26.3 percent
4. The regression coefficient of the artificial intelligence variable (X3) of 0.281 indicates a positive direction. This means that artificial intelligence has a positive relationship with event fraud, where every increase in artificial intelligence is 1 percent while other independent variables are fixed, then event fraud in PT Brinks Solution Indonesia employees will increase by 28.1 percent.

Partial T Test

The t-test was carried out to find out whether E-procurement, internal control, and artificial intelligence partially affected PT Brinks Solution Indonesia's preventing fraud. Acceptance and rejection of hypotheses will be carried out with the following criteria:

a. If the value of sig. ≤ α (0.05) and t calculate > t table, then the hypothesis is accepted.
b. If the value of sig. ≥ α (0.05) and t calculate < t table, then the hypothesis is rejected.

The t-value of the table with a significance level of 0.05 and degrees of freedom (df) is df = n-k-1= 80-3-1 = 76, so the t-value of the table is obtained of 1.991. The results of the partial t-test are presented in the following table:

Table 8
Test t

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	6.606	2.044		3.231	.002
	E Procurement	.334	.088	.344	3.790	.000
	Internal Control	.263	.072	.313	3.669	.000
	Artificial Intelligence	.281	.094	.294	2.977	.004

a. Dependent Variable: Fraud Prevention

Based on the results of the t-test above, then:

1. Hypothesis 1 = It is suspected that E-procurement has a significant positive effect on PT Brinks Solution Indonesia's event fraud

The results of the study in Table 4.11, show that the significance value of the E-procurement variable (X1) < the critical significance value (α = 5%) is 0.000 < 0.05 and the t calculation of the > t table is 3,790 > 1,991, this shows that E-procurement has a significant effect on fraud prevention. The regression coefficient of 0.334 indicates a positive direction. This means that E-procurement has a significant positive effect on PT Brinks Solution Indonesia's event fraud. Based on these results, the first hypothesis proposed by the author was declared accepted.

2. Hypothesis 2 = It is suspected that internal control has a significant positive effect on PT Brinks Solution Indonesia's event fraud

The significance value of the internal control variable (X2) < the critical significance value (α = 5%) was 0.000 < 0.05 and t calculated > t table was 3.669 > 1.991, this shows that internal control has a significant effect on fraud prevention. The regression coefficient of 0.263 indicates a positive direction. This means that internal control has a significant positive effect on PT Brinks Solution Indonesia's event fraud. Based on these results, the second hypothesis proposed by the author was declared accepted.

3. Hypothesis 3 = It is suspected that artificial intelligence has a significant positive effect on PT Brinks Solution Indonesia's prevention of fraud

The significance value of the artificial intelligence variable (X3) < the critical significance value (α = 5%) was 0.004 < 0.05 and the t calculation of the > t table was 2.977 > 1.991, which shows that artificial intelligence has a significant effect on event fraud. The regression coefficient of 0.281 indicates a positive direction. This means that artificial intelligence has a positive effect on PT Brinks Solution Indonesia's event fraud. Based on these results, the third hypothesis proposed by the author was declared accepted.

Simultaneous Test f

The f test was carried out to prove whether the E-procurement, internal control, and artificial intelligence variables simultaneously affected the fraud of PT Brinks Solution Indonesia. The conditions for acceptance or rejection of a hypothesis are as follows:

a) If the significance value (F-statistic) < 0.05 and F calculates > F table, then H4 is accepted, namely E-procurement, internal control, and artificial intelligence simultaneously have a significant effect on event fraud at PT Brinks Solution Indonesia.
b) If the significance value (F-statistic) > 0.05 and F calculates < F table, then H0 is accepted, namely E-procurement, internal control, and artificial intelligence simultaneously do not have a significant effect on event fraud in PT Brinks Solution Indonesia.

The value of the f table at the significance level of 0.05 and the degree of freedom (df) is df = n-k-1 = 80-3-1 = 76, so the f value of the table is 2.72. The results of the multiple regression F test can be seen in the following table:

Table 9
Statistical Test Results f

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	669.106	3	223.035	44.183	.000[b]
	Residual	383.644	76	5.048		
	Total	1052.750	79			

a. Dependent Variable: Fraud Prevention

b. Predictors: (Constant), Artificial Intelligence, Internal Control, E Procurement

Based on the results of the f test above, then:

Hypothesis 4 = E-procurement, internal control, and artificial intelligence simultaneously have a significant effect on event fraud in PT Brinks Solution Indonesia.

The results of the F test in Table 4.12, show that the significance value of F-statistic is smaller than alpha (0.05) which is 0.000 < 0.05 and has an F value calculated > table F of 44,183 > 2.72, this shows that E-procurement, internal control, and artificial intelligence simultaneously have a significant effect on event fraud in PT Brinks Solution Indonesia. Based on these results, the fourth hypothesis proposed by the author was accepted.

Conclusion

E-procurement, as a transparency solution in the procurement of goods and services, brings significant positive changes in improving governance, transparency, and accountability. Through digital platforms, E-Procurement creates an open environment, eliminates ambiguity, and creates a verified digital track record. The data showed

increased vendor participation, stimulated healthy competition, and reduced chances of collusion. The implications of the transformation of E-Procurement on fraud handling are very real for PT Brinks. The high level of transparency leads to increased vendor participation, increased accountability, and strengthened risk management. E-procurement helps uncover collusion practices through open access to data, creating a basis for further preventive and enforcement actions. Internal control also has a significant effect on the level of fraud. Likewise, the use of Artificial Intelligence has a positive influence on fraud prevention.

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