The Influence of IT Governance and Digital Technology Adoption to Institutional Performance Mediated by Instructional Leadership

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***Abstract*— It becomes every stakeholder expectation to get the predicate and acknowledgement of good school institution performance. It is caused plenty of positive things can be gained by the institution, including the competitiveness creation. Taken into account of its indispensable role, then the aim of this inquiry is to confirm some factors which influence the school institution performance and how far those factors' contribution influencing the school institution performance. The principal, vice principal, teachers and administrators staff are the analysis units consist of 202 people from 79 schools spread in some districts in Kalimantan Barat. SEM-AMOS is the statistical analysis employed. This research successfully confirm that digital technology adoption, IT governance and instructional leadership influence positively and significantly to school instructional performance.**

Keywords*— *Digital Technology Adoption, IT Governance, Instructional Leadership, Institutional Performance, SEM-AMOS

I. INTRODUCTION

School as the educational institution keep fighting to get society acknowledgement of its institution quality. As we know the institution quality as one of the attraction for society and learners [1]. The involvement of some stakeholders like principal, vice principal, teachers and administrators staff are needed, moreover the principal must has creative and innovative ideas, and one of them is the employment of digital technology. The accurate target of digital technology is able to support the fulfilment of productivity and work efficiency [2]. In spite of vary type of digital technology applied, as long as technology used properly and aligned with the need, then it may support the growth of institution performance [3].

The massively used of digital technology at school lately [4], can be one should be considered of their support in achieving the institution performance. After all, digital technology adoption cannot be denied currently as it has already become the major need at school activity [5]. Schools rely on digital technology in many aspects of activity. Plenty of school activities need digital technology. From some previous studies stated that digital technology plays an indispensable role in institution growth [6]-[8]. As technology offers the ease of finding what needed in short time. Deserve to be acknowledged that digital technology adoption has direct impact to performance [9]. Indicators for measuring Adoption of digital technology is influenced by perceptions of its utility, usability, and behavioral intent to use it [10].

Other factors that influence institution performance is IT governance [11]. IT governance is a relation structure and process that handle the organization [12]. All IT governance dimensions have their significant and positive impact to organization performance [13]. The IT governance is essential to make sure the existed IT sources able to achieve the expected business advantages [14]. The effectiveness of IT governance can be seen from IT capability in increasing and synergize the IT advantages with vision, mission, goal, and organization value [15]. IT governance have to define clearly to the business aim since the good management of IT may give positive impact to institution performance [16]. The more IT applied, then more attention required from the stakeholders. As the root of problem of IT is the worse of IT governance [17]. It is here the importance of IT governance in order each IT user can be added value to institution.

Institution leadership, in this case the principal as the instructional leadership plays a strategic role to make sure every IT user aligned with business need. A creative, innovative instructional leader and able to influence the subordinates may impact to institution performance attainment [18]. Therefore, the ability to influence and guide the subordinates of a leader is important to achieve the good performance [19]. The leader experience and capability in managing the sources also influence the institution performance [20]. Then the role of instructional leader is very influential to institution performance.

Taken into account the important of institutional performance particularly to school, then this research aim is to confirm some factors that influence the institution performance and how much the factors contribution and influence to institution performance. This research suspects institution performance influenced directly by the instructional leadership, IT governance and digital technology adoption. Besides, institutional performance also influenced indirectly by IT governance and IT adoption through instructional leadership.

II. Research Method

This study conducted on some senior high schools and vocational schools spread within six districts in Kalimantan Barat. Research instruments are used to collect the data and this is a quantitative data analysis or statistic it means to test the established hypothesis in research model [21]. Survey research design using cross sectional survey design is the chosen research design employed in this inquiry [22]. Cross sectional survey run to measure the population behavior through samples about school institution performance as variables in this study. There are 202 people as samples in this inquiry consist of principal, vice principal, teachers, and administrator staff spread within 79 schools. Structural Equation Modelling (SEM) assisted by computer program Analysis of Moment Structure (AMOS) as data analysis applied [23]. There are 46 items in research questionnaire then classified into four (4) groups based on research variables and it is closed. The questionnaire administered to figure out their perception to instructional leadership, digital technology adoption, IT governance and institution performance. Likert scale six (6) point is used to measure attitude and perception [24]. Answering in this format: 1 is strongly disagreeing, 2 is disagreeing, 3 is tending to disagree, 4 is tending to agree, 5 is agreeing, and 6 is strongly agreeing.

III. Result And Discussion

Research questionnaire already administered online using google form application within more than two (2) months and already gained 202 samples. Here is the table of the amount of samples according to school group.

TABLE I. The Number of Samples Based on School Group

No	School Group	Number of Schools	Number of Samples
1	Private High School	25	66
2	Public High School	29	69
3	Private Vocational School	14	38
4	State Vocational High School	11	29
	Amount	79	202

Source: Compilation of Research Results, 2022

The data of samples are delineated in Table 1 based on school groups, it clarifies the accurate of data distribution as the number of samples of each school group comparable to the number of schools. It means the involvement of the stakeholders at schools in completing the questionnaire is already good although 202 (63.92%) samples already completed from 316 samples.

TABLE II. Sample Numbers Based on Respondents' Group

No	Respondents' Group	Number of Samples
1	Principal	39
2	Vice Principal	43
3	Teacher	58
4	Adminsitration Staff	62
	Amount	202

Source: Compilation of Research Results, 2022

The amount of samples based on respondents' group as delineated in Table II above elaborates that plenty of teachers and administrator staff are involving in completing the questionnaire. Whereas the vice principal is less and the principal is the least. However this situation not disturb the data validity to be proceed.

A. Measurement Model Test

The aim of measurement model is to get construct or the suitable latent variable so that can be applied for next phase. Confirmatory Analysis Factor (CFA) test is utilized to gain the construct or suitable variables. The employment of CFA test means to know how good is the variable in presenting data construction or latent variables [25]. As it is multi dimension form then it is operated using Second Order CFA. This inquiry will test the validity and reliability of the constructor indicators. The constructs in this study are IT governance, digital technology adoption, instructional leadership and institutional performance. In this testing, the indicator is valid if has loading factor > 0.5 and p value <0.05 and the construct is reliable if it has CR > 0.7 and AVE > 0.5.

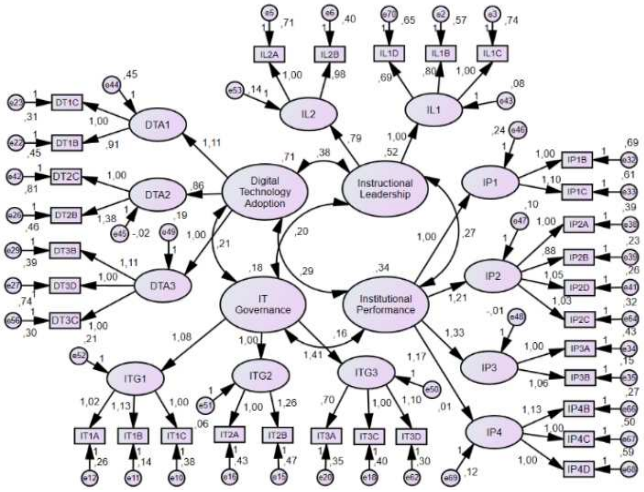

Fig. 1. Measurement Model

All indicators forming each latent variable show high significance with a probability value of less than 0.05 and the critical ratio score is > 2.00 (see Fig. 1). Therefore all indicators are accepted. This condition proves that latent variables forming indicators is an indicator or a good dimension as measurement tool. Then estimation scores, critical ratio and probability can be displayed in Table III below.

TABLE III. Regression Weight

Regression Weights			Estimate	C.R.	P
IL1	<---	Instructional_Leadership	1.00		
IL2	<---	Instructional_Leadership	0.80	6.31	0.001
ITG1	<---	IT_Governance	0.98	7.29	0.001
ITG2	<---	IT_Governance	1.00		
DTA1	<---	Digital_Technology_Adoption	1.11	11.30	0.001
DTA2	<---	Digital_Technology_Adoption	0.87	9.82	0.001
DTA3	<---	Digital_Technology_Adoption	1.00		
IP1	<---	Institutional_Performance	1.00		
IP2	<---	Institutional_Performance	1.18	8.10	0.001
IP3	<---	Institutional_Performance	1.31	8.24	0.001
IP4	<---	Institutional_Performance	1.15	7.67	0.001
IT3	<---	IT_Governance	1.39	7.70	0.001

Source: Compilation of Research Results, 2022

The next step is reliability testing. In this study, the design reliability scores are applied to complete the reliability test. Gozali states that an instrument is reliable when the construct reliability score > 0.7 and the extracted variance score >= 0.50. Yet reliability of 0.6 to 0.7 is still acceptable [26]. Table IV displays construct reliability testing result (CR) to construct and dimension.

TABLE IV. CR AND EXTRACTED VARIANCE TESTING RESULT

Construct	Dimension	Factor Loading	C.R	AVE
IT Governance	Structures	0.05	0.06	0.05
	Processes	0.06		
	Relational mechanisms	0.04		
Digital Technology Adoption	Perceived usefulness	0.05	0.06	0.05
	Perceived Ease of Use	0.06		
	Behavioural intention to use	0.04		
Instructional Leadershp	Defines a School Mission	0.06	0.06	0.05
	Manages the Instructional Program	0.06		
Institutional Performance	Institutional External Environment	0.05	0.07	0.05
	Institutional Decision Processes	0.06		
	Institutional Characteristics	0.04		
	Institutional Strategy	0.06		

Source: Compilation of Research Results, 2022

From the composite or construct validity test result and extracted variance in Table IV above it displays that IT governance variable has its construct reliability score of 0.90, digital technology adoption score is 0.90, instructional leadership score is 0.86 and institutional performance score is 0.94. The construct reliability scores of four variables is higher than cut off value 0.7 it means the indicator has its good internal consistency. Then the extracted variance IT governance variable value is 0.75, digital technology adoption is 0.76, instructional leadership is 0.76 and institutional performance is 0.79. Because the four variables gain extracted variance score > 0.50 then the variance extracted from the indicators is higher for the formation of latent variable.

Discriminant validity done to ensure that every concept of each latent model differ from other variables. Validity testing conducted to figure out how accurate a measurement tool does its function [27]. Discriminant validity can be fulfilled when AVE root score (Average Variances Extracted) greater than correlation score with other variables [28]. Table V shows the cross-loadings and AVE.

TABLE V. CROSS-LOADINGS AND AVE

Construct	IT Governance	Digital Technology Adoption	Instructional Leadership	Institutional Performance
IT Governance	0.87			
Digital Technology Adoption		0.87		
Instructional Leadership	0.55	0.27	0.87	
Institutional Performance	0.39	0.16	0.28	0.89

Source: Compilation of Research Results, 2022

In Table V above it displays that model already fulfilled the accurate discriminant validity since AVE root score of four constructions is greater than the correlation between construction and other constructions. IT governance variable is 0.87, digital technology adoption is 0.87, instructional leadership is 0.87 and institutional performance is 0.89. Thus can be summed up that overall latent construction in this study is unique and can capture the measured phenomenon.

B. *Structural Model Test or Inner Model*

Structural model is the part of SEM model which depicts the connection among the latent variables or among exogenous variables with endogenous variables which have causal relationship [29]. The test to the structural model can be completed to measure how well the observation value resulted from model and the parameter estimation can be conducted using Goodness of Fit Index (GOFI) [30]. Feasibility test model can be stated fulfilled if one of Goodness of Fit Index criteria can be fulfilled [31]. The suitability and validity of the model can be measured based on the Goodness of Fit Index [32]. Figure 2 displays structural model.

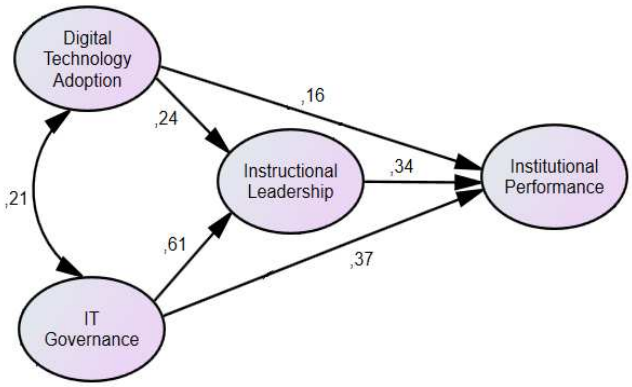

Fig. 2. Structural Model

The multidimensional variables in the structural model consist of four latent variables (see Fig. 2). IT governance variables and digital technology adoption are exogenous variables, institutional performance is endogenous variable and instructional leadership is mediation variable. The relationship of four variables can be clarified that digital technology adoption and IT governance influence directly to instructional leadership and institutional performance. Instructional leadership influence directly to institutional performance, also digital technology adoption and It governance influence indirectly to institutional performance through instructional leadership. Next is Table VI The Testing result of Goodness of Fit Index.

TABLE VI. FIT INDICES MODEL

Goodness of Fit Index	Cut-Off Value	Result	Conclusion
NFI	≥ 0.90	0.85	Marginal Fit
IFI	≥ 0.90	0.92	Good Fit
AGFI	≥ 0.90	0.82	Marginal Fit
GFI	≥ 0.90	0.85	Marginal Fit
CFI	≥ 0.90	0.92	Good Fit
TLI	≥ 0.90	0.91	Good Fit
RMSEA	≤ 0.08	0.05	Good Fit

Source: Compilation of Research Results, 2022

Based on Goodness of Fit Index testing result as delineated in Table VI above, There are three criteria (NFI, AGFI, GFI) whose value is in marginal position and four criteria (IFI, CFI, TLI, RMSEA) with good fit value. Although there is marginal fit score, this research is accepted which means there is no significant different among covariant matrix data from the observed variables using covariant matrix of the specified model (implied covariant matrix). This indicates that structural equation resulted of fit model can be used to elaborate the relationship and the impact between exogenous variable with endogenous variable. Next test significant parameters. In his phase testing done to figure out whether the indicator or dimension indeed able to measure or reflect the latent variable tested. Next is Table VII of path significance test results:

TABLE VII. SUMMARY OF THE PATH SIGNIFICANCE TEST

Path Significance Test	C.R.	P-Value	Description
Digital Technology Adoption → Instructional Leadership	4.42	0.001	Significant
IT Governance → Instructional Leadership	4.07	0.001	Significant
Instructional Leadership → Institutional Performance	2.55	0.011	Significant
Digital Technology Adoption → Institutional Performance	3.01	0.003	Significant
IT Governance → Institutional Performance	3.31	0.001	Significant

Source: Compilation of Research Results, 2022

From the test significant result as in Table VII above, all are significant caused CR > 1.96 or p < 0.05. Though p value in instructional leadership and institutional performance relation > 0.05, but C.R > 1.96 so that still be stated significant. The determination coefficient test (Test R^2) it is done next means to measure how far the model able to clarify the independent variables variation [33]. R values range from 0 to 1, where values closer to 1 reflecting a stronger relationship between the independent and dependent variables [34]. Table VIII The determination coefficient is the following table.

TABLE VIII. COEFFICIENT OF DETERMINATION

Direct Impact	Estimate	R-Square
Digital Technology Adoption → Instructional Leadership	0.27	0.53
IT Governance → Instructional Leadership	0.54	
Instructional Leadership → Institutional Performance	0.28	0.52
Digital Technology Adoption → Institutional Performance	0.16	
IT Governance → Institutional Performance	0.34	

Source: Compilation of Research Results, 2022

From the result of determination coefficient test as in Table VIII above, determination coefficient value (R-Square) on endogenous variable instructional leadership is 0.53. It explains that digital technology adoption variable and IT governance simultaneously able to clarify the variant of instructional leadership variable is 53%, whereas the rest of 47% affected by other not tested variables in this inquiry. Next the determination coefficient value (R-Square) on endogenous variable institutional performance is 0.52. This explains that instructional leadership variable, digital technology adoption and IT governance simultaneously able to clarify the institutional performance variable variation is 52% and the rest is 48% influenced by other not tested variables in the study.

C. Path Coefficients

Path coefficient is as an useful value employed in directing relationship direction on variables, whether a hypothesis has positive direction (close to 1) or negative (close to negative 1) [35]. Positive value means the impact to variable in the same direction. If the value of exogenous variable increase, thus the value of endogenous variable also increasing. Negative value means the impact of the variable is opposite direction, if the value of exogenous increase, thus the endogenous variable value decreasing. If the p-value is less than 0.05, the probability value is significant; otherwise, it is not.

TABLE IX. VALUE OF A PATH COEFFICIENT

Path Coefficient	Estimate	P-Value	Description
Digital Technology Adoption → Instructional Leadership	0.27	0.001	Positif & Significant
IT Governance → Instructional Leadership	0.54	0.001	Positif & Significant
Instructional Leadership → Institutional Performance	0.28	0.011	Positif & Not Significant
Digital Technology Adoption → Institutional Performance	0.16	0.003	Positif & Significant
IT Governance → Institutional Performance	0.39	0.001	Positif & Significant

Source: Compilation of Research Results, 2022

Data in table IX above can be clarified that digital technology adoption variable has significantly and positively effect to instructional leadership variable is 0.27 and p value < 0.05. IT governance variable has significant and positive effect on the instructional leadership variable is 0.54 and p < 0.05. Instructional leadership variable has insignificantly and positively effect to institutional performance variable is 0.28 and p > 0.05. Digital technology adoption variable has significant and positive effect on institutional performance variable is 0.16 and p < 0.05. IT governance variable has significant and positive effect on institutional performance variable is 0.39 and p < 0.05.

Path analysis test is the next actions to do in the next phase. Path analysis is the extension of regression model, not only to see whether or not the effect of independent variable but also to test the direct and indirect impact. The size of an indirect effect is the path coefficient multiple among independent variables within one direction, whereas the magnitude of a direct influence is the magnitude of the path coefficient value independent variable. To calculate the magnitude of indirect impact, the Sobel test formula is used to a mediated variable (see Table X).

TABLE X. PATH COEFFICIENT DIRECT INFLUENCE AND INDIRECT INFLUENCE

Path Coefficient	Impact	
	Direct	Inderect
Digital Technology Adoption → Instructional Leadership	0.27	
IT Governance → Instructional Leadership	0.54	
Instructional Leadership → Institutional Performance	0.28	
Digital Technology Adoption → Institutional Performance	0.16	
IT Governance → Institutional Performance	0.39	
Digital Technology Adoption → Instructional Leadership → Institutional Performance		2.21
IT Governance → Instructional Leadership → Institutional Performance		2.18

Source: Compilation of Research Results, 2022

From Table X above able be clarified that the magnitude of direct impact digital technology adoption to instructional leadership is 0.27. It explains that digital technology adoption impact instructional leadership. The increasing use of digital technology, will increase instructional leadership in teaching learning process and empower teachers professionally. The magnitude impact of IT governance to instructional leadership is 0.54. This clarifies the better of IT management, the more increasing instructional leadership to employ the digital technology caused of the well IT management able to add value to institution. The magnitude impact of instructional leadership to institutional performance is 0.28. It means when there is an increasing capability of instructional leadership, thus may provide the

higher opportunities to reach the institutional performance. The magnitude impact of digital technology adoption to instructional performance is 0.16. This means that the massively employment of digital technology at school able to support the increasing of institutional performance though the opportunity not really high. The magnitude impact of IT governance to institution performance is 0.39. This explains that the more professional of IT governance provides more opportunities towards increasing institutional performance.

In general research outcome support some previous studies in other side instructional performance at schools is impacted by IT governance, instructional leadership and digital technology adoption. Digital technology adoption mediated is regarded as the new findings in this study proven able to strengthen the IT governance and instructional leadership impact to institutional performance. This atmosphere gives the stakeholders understanding that institutional performance not only able to grow through principal instructional leadership also through the well IT governance, but digital technology adoption is required to support institution activities. Principal has to support the employment of digital technology as a way to increase school service quality. Also the IT governance, the stakeholder has to ensure that IT governance employed have to manage well in order to bear advantages and the added value in achieving the organization's goal and finally able to enhance the institutional performance. The magnitude of indirect impact digital technology adoption on institutional performance by instructional leadership mediated is 2.21. This proves that instructional leadership as mediated variable has been strengthen the relation between digital technology adoption on institutional performance. The higher digital technology usage and the higher support of instructional leadership, becomes one increasing factor of institutional performance. The magnitude of indirect influence of IT governance mediated by instructional leadership is 2.18. The magnitude of influence value proves that there is the increasing IT governance impact on institutional performance. The well IT management and the high support then the willingness of the institutional leadership, able to achieve the well institutional performance.

IV. Conclusion

Based on various tests completed, this study proves and supports some previous studies which stated that digital technology adoption, IT governance and instructional leadership influence on institutional performance. Even through mediation of instructional leadership variable, the impact of digital technology adoption and IT governance is increasing on institutional performance. The outcomes of this inquiry able be as references for school institution to pay attention to influenced aspects on institutional performance. Principal as instructional leadership has to be a leader that able to bring changes through various IT employment in relation to learning process and school administration. The awareness to perform well IT governance also must be the attention for stakeholders whatever the existed digital technology are, can be used effectively to achieve and enhance the well institution performance. But it is very unfortunate that the lack of data obtained so that it may have an impact on the accuracy of the model. In the future study, some new indicators can be involved or new dimensions which able to present the actual situation and learners can be involved as respondents.

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