Analysis Audit Information Technology : Green Technology, Smart System And Innovation Behavior Working For Improving Business Services University In Indonesia (Case Study : UIN Surabaya and UIN Malang)

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ABSTRACT

This study was conducted to determine the effectiveness and efficiency of the use of technology and integrated information systems and recommend the development of new systems at PTKIN (UIN Sunan Ampel Surabaya and UIN Maulana Malik Ibrahim Malang). The study of information technology management in tertiary institutions aims to measure the extent to which the application of information technology is able to support the activities of the Tri Dharma College in order to achieve world class universities. In measuring the results of the audit of information technology management the tertiary institution will conduct evaluation, monitoring and further development of information system components needed in the overall system integration by using COBIT framefork which is expected to have a high level of maturity (maturity level) such as IT Infrastructure Components, Superstructure Components Campus, Stakeholder Profile Components, Variety of IT and Application Utilization Components, National Education Strategy Components, Technology Impact Impact Components, External Community Components, and Trend Adoption Components. The conclusion from the results of this study is that Green Technology has an influence on the Improvement of Organizational Business Services, and Green Technology has an influence on Organizational Business Performance Improvement. Integrated Smart Systems affect the Improvement of Organizational Business Services and Integrated Smart Systems affect the Improvement of Organizational Business Performance. Then Information Technology Audit Management has an influence on Organizational Services Improvement and Information Technology Audit Management has an influence on Organizational Business Performance Improvement. In addition, Work Behavior Innovation has an influence on Organizational Service Improvement and Work Behavior Innovation Influences Organizational Business Performance Improvement.

Keywords: Green, Smart, Audit, Information Technology, Busseness, System, and University

INTRODUCTION

Integrating systems is one of the key concepts of management information systems. Various systems are interconnected with each other in various ways in accordance with the purpose of integration. Good, structured and reliable information technology (IT) management is an absolute necessity for education services, especially at tertiary institutions. The main objective of information technology governance is to reduce risk and ensure that investments in the form of information technology resources can increase corporate value (Hall 2011). The role of significant

information technology must be balanced with appropriate arrangements and management so that possible losses can be avoided.

The use of information systems functions has become an important part for all types of organizations. Likewise, developments in the education service sector are known as Academic Information Systems (AIS). Academic Information System is an absolute necessity in education services at tertiary institutions, thus providing convenience in administrative services. To keep information technology becoming an added value at the Sunan Ampel State Islamic University of Surabaya and UIN Malik Malang, it is necessary to have information technology governance so that all factors and dimensions related to the use of information technology are synergized. The convenience and improvement of services for stakeholders in the Sunan Ampel State Islamic University Surabaya and UIN Malik Malang can continue to be improved by applying targeted information technology.

Sunan Ampel State Islamic University of Surabaya and UIN Malik Malang each have an Academic Information System which is a data management system such as student score data, course data, teaching staff data (lecturers) and faculty / department administration, and so on. Besides, Sunan Ampel State Islamic University Surabaya and UIN Malik Malang also have E-Learning, and E-Kinerja is distance learning using computer technology, computer networks and the Internet. E-Learning allows learning to learn through computers in their respective places without having to physically go to attend classes / lectures in class. E-Learning is also often understood as a form of web-based learning that can be accessed from intranets on local networks or the internet. Actually e-learning material does not have to be distributed on-line either through local networks or the internet. Then E-Kinerja is used to carry out performance evaluations by workers such as reporting Lecturer Workload (BKD), Weekly Work Reports (LKM), Semester Work Reports (LKS) and Annual Work Reports (LKT).

With the three systems, Sunan Ampel State Islamic University Surabaya and UIN Malik Malang can process data properly. But in fact Academic Information Systems, e-learning and e-performance are not currently well integrated. Examples of technical problems that occur are when in the process of admitting new students, data input is done into the Academic Information System database often repeats, the problem is the data that has been entered into the Academic Information System database will not automatically be stored in the e-learning database but must be inputted automatically Manual in e-learning is a problem that can later affect data processing on the system, there will be students who are not registered to e-learning even though they are students at Sunan Ampel State Islamic University Surabaya and UIN Malik Malang. The problem that occurs is the proper process can be done with one time action, must be done with two actions that cause a lack of time efficiency and susceptible to errors that will occur. In addition, the system that has been developed does not carry out a comprehensive evaluation process on the effectiveness and efficiency of the system so that there is no correction to the system that is already running.

With the integrated technology and information system audit research as an innovation to improve quality and performance efficiency as well as the potential for system development towards world class universities (Case Study: Uin Sunan Ampel Surabaya and UIN Maulana Malik Ibrahim Malang) is expected to provide the best solution of all system integration problems and the evaluation process follows, so that system improvements are found, recommendations for new system requirements have the potential to be developed or integrated. Based on the background of the above problems, a problem can be formulated as follows: Does Green Technology Have an Effect on Increasing Organizational Business Services?, Does Green Technology Influence Organizational Business Performance Improvement?, Does the Integrated Smart System Affect

the Improvement of Business Services Organizations?, Does the Integrated Smart System Influence Organizational Business Performance Improvement? Does Management of Information Technology Audit Influence Organizational Services Improvement?, Does Management of Information Technology Audit Influence Organizational Business Performance Improvement?, Does Work Behavior Innovation Influence Organizational Services Improvement?, Does Work Behavior Innovation Influence Organizational Business Performance Improvement?

METHOD

2.1. Research Sampling

The determination of the sample in this study is intended to capture as much information as possible from a variety of sources including students, employees who are scattered in administrative units, PUSTIPD, Academic, LPPM, LPM, SPI, Faculties, Departments, Study Programs and others. Thus the purpose of determining the sample is

a. to specify in particular the specifics in a unique formula
b. explore the information that forms the basis of the emerging theory design. Therefore there are no random samples, but the determination of the sample with a purposive sample.

2.2 Research Instruments.

The first stage of the research, to collect data from the needs (need assessment) for auditing and management analysis of the impact of the use of integrated information system technology in Higher Education through SWOT, the instrument used was an observation sheet containing:

1. Problems / weaknesses that are often experienced by integrated information systems
2. The potential / strength of integrated information owned by UIN Sunan Ampel Surabaya and UIN Malik Ibrahim Malang
3. The initial idea to overcome the problem by paying attention to the potential of UIN Sunan Ampel Surabaya and UIN Malik Ibrahim Malang at the level of integrated information system usage.

2.3 Data Source

The data used in this study are secondary data obtained from the universities of Sunan Ampel UIN Surabaya and UIN Malang, namely data about the influencing factors and indicators related to Green Information Technology, Smart System Integration, Audit management, Information Technology, innovation work, service and performance.

2.4. Identification of Research Variables

The variables used in this study used 6 observed variables or observed variables, namely:

A: Green Information Technology
B: Smart Information System Integration
C: Management of Information Technology audits
D: Workplace innovation
E: Service
F: Performance

2.5. Data Analysis Method

This analysis is based on the research objectives, while the steps are as follows:

1. SEM Estimated Parameters - Partial Least Square (PLS):
SEM parameter modeling estimation using PLS approach is obtained through a three-stage iteration process using Ordinary Last Square (OLS), which is as follows:

a. The first stage determines the weight estimation (Weight Estimate) to set a score or calculate latent variable data.
b. The second step determines the path estimation (estimation for inner and outer models) that connects between latent variables and the estimated loading between latent variables and their indicators.
c. The third stage determines the average estimate and parameter location for indicators and latent variables.

2. The steps of analyzing the structural fit model with SEM- Partial Least Square (PLS):
In this study, data analysis on SEM-PLS will use the help of SmartPLS software.

a. Get a concept-based model and theory to design a structural model (the relationship between latent variables) and measurement models, namely the relationship between indicators and latent variables.
b. Make a path diagram (path diagram) that explains the pattern of relationships between latent variables and indicators.
c. Convert a path diagram into an equation.
d. Evaluating the goodness of fit, namely by evaluating the measurement model (outer model) by looking at validity and reliability. If the measurement model is valid and reliable, the next stage can be carried out, namely the evaluation of structural models. If not, then it must re-construct the path diagram.
e. Model interpretation.

2. 6. Analysis Tools

This research uses Partial Least Square (PLS) as an analysis tool. PLS is one method for applying the Structural Equation Modeling (SEM) model. PLS is a powerful analytical method because it can be applied at all data scales, it does not require a lot of assumptions and the sample size does not have to be large (Meilita et al, 2016). Besides being able to be used to confirm theories, PLS can also be used to explain the presence or absence of relationships between latent variables. PLS can simultaneously analyze constructions formed with reflective and formative indicators. This study uses PLS to determine the relationship between latent variables consisting of information overload, excessive communication, social media fatigue, and job performance.

Table 1. Validity Test Parameters in the PLS Measurement Model

Uji	Parameter	Rule of tumbs
Validitas Konvergen	Faktor Loading (Outer Loading)	>0,7
	Average Variance Extracted (AVE)	>0,5
	Communality	>0,5
Validitas Deskriminan	Akar AVE dan korelasi variabel laten	Akar AVE > korelasi variabel laten (Discriminant Validity)
	Cross Loading (Discriminant Validity)	>0,7 dalam satu variabel
Reliabilitas	Cronbach Alpha	>0,6
	Composite Reliability	>0,6

Sumber: Chin (1995); Werts et al. (1974) Salisbury et al. (2002); Hartono dan Abdillah (2011)

RESULTS

3.1 Model Fit SEM - PLS Estimation

Structural Equation Model Analysis with SEM - Partial Least Square (PLS)
1. Construction Diagram Path

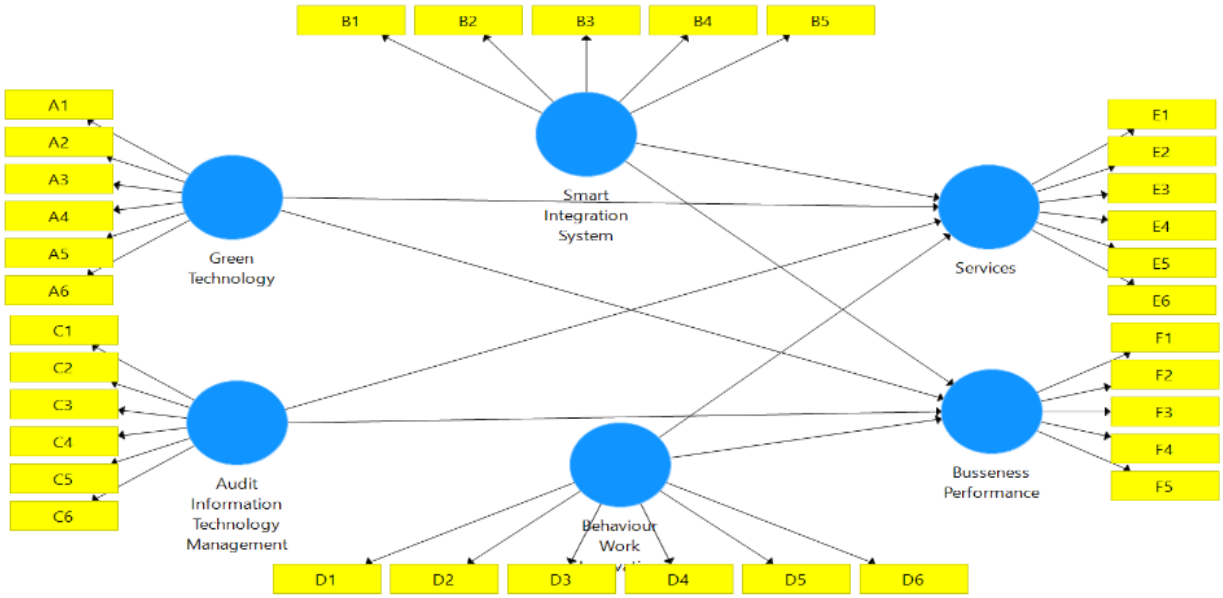

Figure 3. Conceptual Framework for Research Based on Structural Equation Models Source: Talangko (2009)

3.2 Outer Model

For exogenous latent variables 1 (reflexive)
$X\_1 = \lambda\_X1\ \xi\_1 + \delta\_1$
$X\_2 = \lambda\_X2\ \xi\_1 + \delta\_2$
$X\_3 = \lambda\_X3\ \xi\_1 + \delta\_3$
$X\_4 = \lambda\_X4\ \xi\_2 + \delta\_4$
For endogenous latent variables (reflexive)
$Y\_1 = \lambda\_Y1\ \eta + \varepsilon\_1$
$Y\_2 = \lambda\_Y2\ \eta + \varepsilon\_2$

3.3 Inner model

$\eta = \gamma\_1\ \xi\_1 + \gamma\_2\ \xi\_2 + \gamma\_3\ \xi\_3 + \zeta$
services = γ_1 Green. + γ_2 SmartTI + γ_3 AuditTI + + γ_4 Behaviour+ζ (zeta / structural error rate)
busseness performance = γ_1 Green. + γ_2 SmartTI + γ_3 AuditTI + + γ_4 Behaviour+ + ζ (zeta / structural error rate)

3.4. Model Evaluation

Evaluation of Measurement Model (Outer Model).
In this study, the validity and reliability testing of each latent variable will be tested, namely the Green Information Technology variable, Smart System Integration, Information Technology audit

management, workplace innovation, service and performance using the help of SmartPLS software. The individual reflexive measure is said to be valid if it has a loading value (λ) with the latent variable you want to measure ≥ 0.5, if one indicator has a loading value (λ) <0.5 then the indicator must be dropped (dropped) because it will indicate that the indicator is not good enough for measure latent variables precisely.

The following is the output of the structural equation path diagram output on PLS using SmartPLS software.

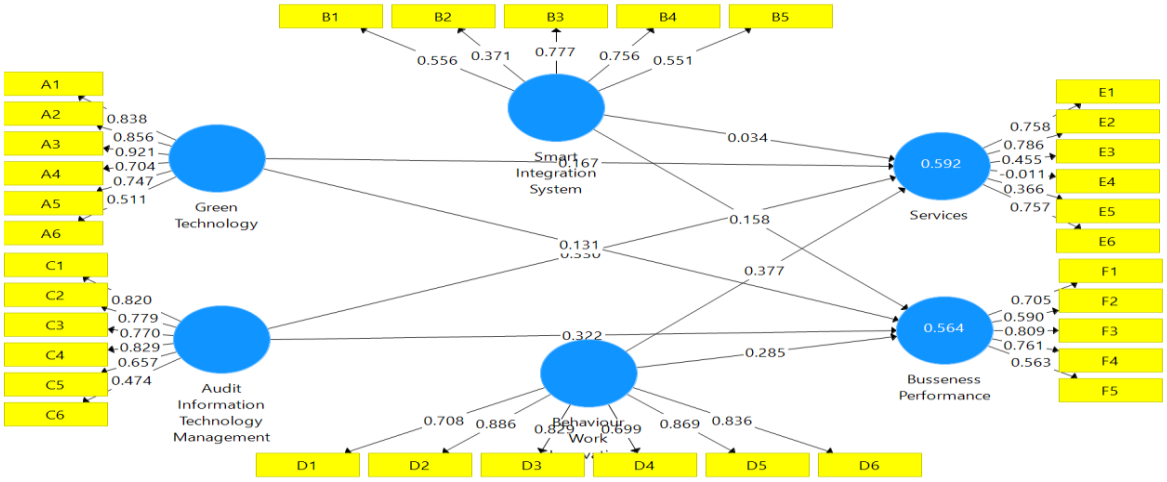

Figure 4. Path diagram of PLS structural equation with Smart PLS software

From Figure 4. above, it can be seen that there are four indicator variables with a loading value (λ) <0.5, namely the indicator variables A6, C6, B2, E3, E4, and E5, then the indicator must be discarded. Following are the second outputs, structural equation path diagram for PLS using SmartPLS software

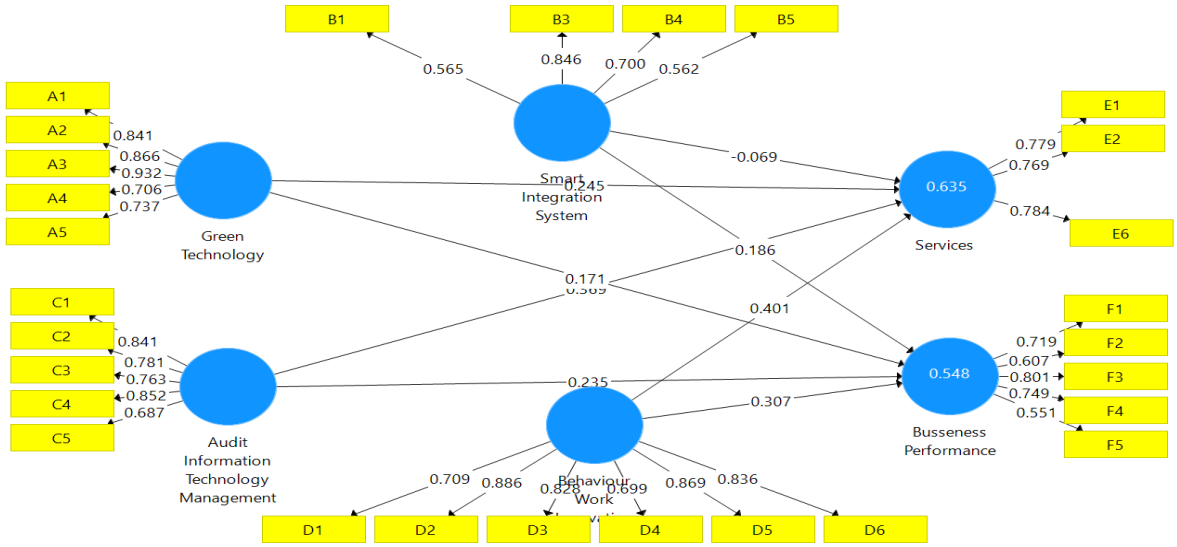

Figure 5. Path diagram of PLS structural equation with Smart PLS software

From Figure 5. above it can be concluded that all the values of the results of the analysis of the indicator path are already above 0.5.

DISCUSSION

4.1 Test the validity and Reliability

4.1.1. Construct Reliability and Validity Results

Contruct Reliability and Validity to test the reliability and validity of indicators on dimensions or variables. Dimensions or variables are said to meet Construction Reliability and Validity if they have a combined reliability value> 0.6.

Construct Reliability and Validity

Matrix | Cronbach's Alpha | rho_A | Composite Reliability | Average Variance Extracted (AVE) | Copy to

	Cronbach's Alpha	rho_A	Composite Reliability	Average Variance Extracted (AVE)
Audit Information Technology Management	0.846	0.859	0.890	0.619
Behaviour Work Innovation	0.893	0.905	0.918	0.653
Busseness Performance	0.721	0.738	0.818	0.478
Green Information Technology	0.876	0.882	0.911	0.673
Services	0.677	0.682	0.820	0.604
Smart Integration System	0.620	0.660	0.768	0.460

Figure 6. Construct Reliability and Validity Results

From the results of the PLS analysis in Figure 6. it was found that Contruct Reliability and Validity for Information Technology Audit Management with a Cronbach Alpha value of 0.846 and Composite Reliability value of 0.859, and Average Variance Extrated (AVE) with a value of 0.619. All values displayed are valid and realible. Likewise other variables such as Green Technology, Smart IT, Innovation, Public Service Behavior, Service and Business Performance are also valid with values above 0.6.

4.1.2. Results of Discriminant Validity

Discriminant Validity is assessed based on cross loading, the model has sufficient discriminant validity if the value of cross-loading between constructs is greater than the value of cross-loading between constructs and other constructs in the model (Jogiyanto, 2009). Significance of Discriminant value The validity of the value is more than 0.5.

Discriminant Validity

Fornell-Larcker Criterion | Cross Loadings | Heterotrait-Monotrait Ratio (HTMT... | Heterotrait-Monotrait Ratio (HTMT... | Copy to Clipboard: | Excel Format | R Format

	Audit Information Technology...	Behaviour Work I...	Busseness Perform...	Green Information Techn...	Services	Smart Integration System
Audit Information Technology Manage...	0.787					
Behaviour Work Innovation	0.513	0.808				
Busseness Performance	0.587	0.637	0.691			
Green Information Technology	0.436	0.643	0.588	0.821		
Services	0.637	0.711	0.695	0.620	0.777	
Smart Integration System	0.649	0.537	0.611	0.631	0.541	0.678

Figure 7. Discriminant Validity Results

From the results of the PLS analysis in Figure 7. it was found that Discriminant Validity for Management of Information Technology Audit, Green Technology, Smart Technology Integration, Innovation Behavior Innovation, Service and Business Performance are also all valid with an average value above 0.5

4.1.3 Outer Loading Results

Outer Loading is valued based on means, STDEV, T-Value and P-Value. The significance of the Outer Loading value is less than 0.5.

Outer Loadings

Mean, STDEV, T-Values, P-Values | Confidence Intervals | Confidence Intervals Bias Corrected | Samples

	Original ...	Sample ...	Standard Deviation...	T Statistics ...	P Values
A1 <- Green Information Technology	0.834	0.832	0.047	17.888	0.000
A2 <- Green Information Technology	0.871	0.867	0.049	17.610	0.000
A3 <- Green Information Technology	0.927	0.926	0.023	40.299	0.000
A4 <- Green Information Technology	0.674	0.663	0.149	4.532	0.000
A5 <- Green Information Technology	0.778	0.777	0.083	9.318	0.000
B1 <- Behaviour Work Innovation	0.709	0.695	0.144	4.907	0.000
B3 <- Behaviour Work Innovation	0.800	0.796	0.077	10.461	0.000
B4 <- Behaviour Work Innovation	0.603	0.588	0.200	3.013	0.003
B5 <- Behaviour Work Innovation	0.520	0.501	0.191	2.724	0.007
C1 <- Audit Information Technology Management	0.819	0.816	0.073	11.273	0.000
C2 <- Audit Information Technology Management	0.810	0.812	0.066	12.215	0.000
C3 <- Audit Information Technology Management	0.804	0.794	0.087	9.241	0.000

Figure 8. Outer Loadings

From the results of the PLS analysis in Figure 8, it was found that Outer Loading for all indicator variables such as Information Technology Audit Management, Green Technology, Smart Technology Integration, Innovation Behavior Innovation, Service and Business Performance are also all valid with an average value below 0.5 .

5. Path Coefficients Results

Path Coefficients are valued based on means, STDEV, T-Value and P-Value. The significance of the Outer Loading value is less than 0.5.

Path Coefficients

Mean, STDEV, T-Values, P-Values | Confidence Intervals | Confidence Intervals Bias Corrected | Samples | Copy to (

	Original ...	Sample ...	Standard ...	T Statistic...	P Values
Audit Information Technology Management -> Green Information Technology	0.445	0.461	0.126	3.533	0.000
Audit Information Technology Management -> Smart Integration System	0.515	0.543	0.104	4.963	0.000
Behaviour Work Innovation -> Services	0.209	0.233	0.135	1.548	0.122
Green Information Technology -> Behaviour Work Innovation	0.702	0.715	0.071	9.882	0.000
Smart Integration System -> Busseness Performance	0.666	0.698	0.075	8.858	0.000
Smart Integration System -> Services	0.590	0.581	0.122	4.850	0.000

Figure 9. Path Coofficients

From the results of the PLS analysis in Figure 9, it was found that Path Coofficients for Management of Information Technology Audit, Green Technology, Smart Technology Integration, Work Behavior Innovation, Service and Business Performance are also all valid with an average value below 0.5. As for the variable Work Behavior Innovation not service has a value above 0.5.

CONCLUSION

Based on data analysis and discussion of research results, the following conclusions can be drawn:

1. The results of testing on Green Technology affect the Improvement of Business Services Organization Improvement
2. Test results on Green Technology affect the Improvement of Organizational Business Performance
3. The test results on the Integrated Smart System have an effect on the Improvement of Organizational Business Services
4. The test results on the Integrated Smart System affect the Improvement of Organizational Business Performance
5. Test results on Information Technology Audit Management affect the Improvement of Organizational Services
6. The results of testing on Management of Information Technology Audit affect the Improvement of Organizational Business Performance
7. Test results on Work Behavior Innovation have no effect on Organizational Improvement
8. Test results on Work Behavior Innovation affect the Improvement of Organizational Business Performance

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