ABSTRACT

The development of Information Technology (IT) has been mainly discussed nowadays, from the top to the lowest level of society. The application of IT helps companies to solve problems and even more, the application of IT has been able to provide business strategic decisions support. Many enterprises decided to allocate large budget on IT implementation where this is in line with increasingly sophisticated expectations from IT. With the assumption that the larger budget on enterprises spent on IT application, the greater the benefits they will receive. Unfortunately, IT implementation does not always give an advantage to the company. There are times when the IT implementation does not give any benefit. This situation is called IT Productivity Paradox. The question is then how IT Productivity Paradox can be prevented. The analysis we will get the significance of the IT processes which is linked to its IT Goal. By knowing the significance of the IT processes, it can be seen which one is the significant process and which one is not to the IT Goal. If the IT process are not significant to the IT Goal, the process does not need to be improved because it has no effect to the IT Goal. This research was conducted to obtain the Maturity Level from each IT process and the IT process are not significant to the IT Goal, the process does not need to be improved because it has no effect to the IT Goal. The result of this research is that IT Processes are significant to IT Goal. It can be concluded that IT Productivity Paradox was not occurred.

Keywords: COBIT, maturity level, IT goal, business goal, significance.
(ITG19) “ensuring that important and confidential information is hidden from the parties who are not interested”. The result of this research is that all of the IT Process from ITG19 is significant. So, IT Productivity Paradox does not occur in this case study.

**METHODOLOGY**

This section describes the steps used to solve the research problem. There are two steps that must be done, they are, determine maturity level and calculate the significance with SEM using GSCA.

There are five steps that must be done to determine maturity level: defining the scope, data collection, due diligence, determine the level of security, and determining the results of the audit of information systems. (Revinggar, et al. 2012)

**Defining the Scope**

According to Sarno (2009), by defining the scope and purpose of the audit and also by taking into account the direction of the management, an Auditor will have a most high-risk IT process. Studies conducted earlier stated that the Higher Education Academic data has a high degree of risk in terms of data criticality and confidentiality (Tanuwijaya and Sarno, 2010). Academic regulations which are applied will affect the academic data. IT which is applied in the university is expected to ensure that important and confidential information can only be accessed by the right people. The need for the process must meet “Tri Darma Perguruan Tinggi” (Three Mission of Higher Learning Institution) of the university, must comply with government regulations, the quality of education that was promised to the people university, must comply with government regulations, Mission of Higher Learning Institution) of the interviewed are in accordance with the criteria in RACI.

**Calculating The Significance Value**

By using SEM, researchers can do things like check the validity and reliability, test the relationship between variables in the model and get the models used for prediction. If the SEM input is in the form of the covariance matrix, SEM will produce a structure that can be used to proof the model. Whereas if the input is in the form of correlation matrix, SEM can be useful for checking the size of the independent variables. By doing so, SEM can be used to determine the dominant variable. Steps to perform SEM according Ghozali on Mukaromah & Subriadi (2015):

1. Development of theoretical models.

   The topic of research in-depth analysis and start doing a hypothesis.
2. Develop a path diagram.
Arrangement of structural models to connect between latent constructs (endogenous and exogenous) and arrange the measurement models.

3. Change the path diagram into a structural equation.
The conversion path diagram into the equation.

4. Select the input matrix for data analysis.
Enter the input data in the form of variants or covariance matrix or correlation matrix.

5. Assessing the model identification.
The estimation of the structural equation models. The Estimation of structural equations can use maximum likelihood estimation.

6. Assessing Goodness of Fit criteria.
There are three kinds of goodness of fit: absolute fit measure, incremental fit measure and parsimonious fit measure. Absolute fit measure is used to measure the overall model fit, while incremental fit of the proposed measure is to compare the model with another model. Parsimonious fit measure is to perform adjustment to fit measurements to be compared between models with a number of different coefficient.

7. Interpretation of the model.
The model modification improvements to improve theoretical explanation.

GSCA is a new method of SEM-based components that can be used to perform score calculation and can also be applied to small sample (Tenenhaus, 2008). GSCA can also be used on the relationships between variables which are complex, involving higher order and Multi group comparison. In addition, GSCA can also be applied to the structural model which has a strong theoretical basis.

Before performing the test GSCA, research data must first pass the linearity test. This is because of the assumption that the required relationship in the equation is linear GSCA (Subriadi, 2013).

RESULTS
This part explain the Results of the interviews conducted. The obtained results is maturity level of each process. Here are the results of Maturity Level assessment:

a). PO6 Maturity Level

| Level | Compliance | Normalize | Contribution |
|-------|------------|-----------|--------------|
| 0     | 0.000      | 0.000     | 0.000        |
| 1     | 0.580      | 0.221     | 0.221        |
| 2     | 0.442      | 0.168     | 0.337        |
| 3     | 0.661      | 0.252     | 0.757        |
| 4     | 0.663      | 0.253     | 1.011        |
| 5     | 0.277      | 0.106     | 0.528        |
| **Sum** | **2.622** | **0.616** | **2.853**    |

As it can be seen at Table - 1, PO6 Maturity Level is 2.853. In representation of Maturity Model, it is Repeatable but Intuitive. It means that:

- The needs and requirements of an effective information control environment are implicitly understood by management, but practices are largely informal.
- The need for control policies, plans and procedures is communicated by management, but development is left to the discretion of individual managers and business areas.
- Quality is recognized as a desirable philosophy to be followed, but practices are left to the discretion of individual managers.
- Training is carried out on an individual, as-required basis.

b). DS5 Maturity Level

| Level | Compliance | Normalize | Contribution |
|-------|------------|-----------|--------------|
| 0     | 0.264      | 0.077     | 0.000        |
| 1     | 0.498      | 0.146     | 0.146        |
| 2     | 0.248      | 0.072     | 0.145        |
| 3     | 0.619      | 0.181     | 0.543        |
| 4     | 0.972      | 0.284     | 1.138        |
| 5     | 0.816      | 0.239     | 1.195        |
| **sum** | **3.416** |           |              |

**Maturity Level = 3.166**

As seen at Table - 2, DS5 Maturity Level is 3.431. In representation of Maturity Model, it is Defined Process. It means that:

- Security awareness exists and is promoted by management.
- IT security procedures are defined and aligned with IT security policy.
- Responsibilities for IT security are assigned and understood, but not consistently enforced.
- An IT security plan and security solutions exist as driven by risk analysis.
- Reporting on security does not contain a clear business focus.
- Ad hoc security testing (e.g., intrusion testing) is performed.
- Security training is available for IT and the business, but is only informally scheduled and managed.

c). DS11 Maturity Level

| Level | Compliance | Normalize | Contribution |
|-------|------------|-----------|--------------|
| 0     | 0.000      | 0.000     | 0.000        |
| 1     | 0.466      | 0.110     | 0.051        |
| 2     | 0.932      | 0.220     | 0.205        |
| 3     | 1.000      | 0.236     | 0.236        |
| 4     | 1.000      | 0.236     | 0.236        |
| 5     | 0.833      | 0.197     | 0.164        |
| **Sum** | **4.231** |           |              |

**Maturity Level = 0.893**
As can be seen at Table - 3, DS11 Maturity Level is 0.893. In representation of Maturity Model, it is Non-Existent. It means that:
- Data are not recognized as corporate resources and assets.
- There is no assigned data ownership or individual accountability for data management.
- Data quality and security are poor or non-existent.

d). DS12 Maturity Level

As it can be seen in Table - 4, DS12 Maturity Level is 0.740. In representation of Maturity Model, it is Non-Existent. It means that:
- There is no awareness of the need to protect the facilities or the investment in computing resources.
- Environmental factors, including fire protection, dust, power, and excessive heat and humidity, are neither monitored nor controlled.

DISCUSSIONS

IT process Maturity Level of IT Goal 19 (Ensure that critical and confidential information is withheld from those who should not have access to it) is illustrated in Table - 5.

The two lowest Maturity Level assessment value is on IT process DS11- Manage Data (0.89) and DS12 - Manage the Physical Environment (0.74), it means that those IT processes have to be improved. The improvement of IT process can be done by fulfilling the detail item on each control objectives (each IT process has control objective). IT control objectives provide a complete set of high-level requirements to be considered by management for effective control of each IT process. They are statements of managerial actions to increase value or reduce risk. They consist of policies, procedures, practices and organizational structures designed to provide reasonable assurance that business objectives will be achieved and undesired events will be prevented or detected and corrected.

As it can be seen in Table - 4, DS12 Maturity Level is 0.740. In representation of Maturity Model, it is Non-Existent. It means that:
- There is no awareness of the need to protect the facilities or the investment in computing resources.
- Environmental factors, including fire protection, dust, power, and excessive heat and humidity, are neither monitored nor controlled.

Inferential Analysis

The result of model FIT from GSCA is explained below as can be seen at table - 6.

FIT
FIT value shows the total value of all the variables that can be explained by the particular model. FIT values ranged numbers from 0 to 1. If the value of the FIT is close to 1, it can be said that the better the model explains the phenomenon under study. This is because the value of 1 describes the proportion of variable that can be explained by the greater structural model. Based on Table 5.2 it can be seen that the model which is formed, can explain all the variables that exist, at 0.460. This means PO6, DS5, DS11, DS12, ITG19 and BG12 can be explained by the model by 46% and the 59% can be explained by other variables.

AFIT
AFIT value is used for comparison of the value of FIT. The difference with the FIT value, is AFIT also taking into account the complexity of the model. Based on the obtained values from Table 5.2 the AFIT has value 0.445. The AFIT value is not much different from the FIT value so it can support the conclusions of FIT value. Based on the AFIT value, PO6, DS5, DS11, DS12, ITG19 and BG12 can be explained 44.5% by the model.

GFI
The GFI value indicates whether the model is appropriate or not. GFI value range is from 0 to 1. From Table 5.2 it can be seen that the value of GFI is 0.995, which means that the overall model is very appropriate because GFI value close to 1.

SRMR
SRMR is the addition of FIT model size. According to Imam Ghozali, SRMR value <0.08 indicates the suitability of the overall model. Based on Table 5.2 it can be seen that the value SRMR produced is 0.228 which indicates that the model does not fit based on SRMR.

NPAR
NPAR value indicates the number of free parameters used in the calculation of GSCA. Based on the FIT model table above, it can be seen that the value NPAR is equal to 77.

R Square Identification

Based on Table - 7 it can be seen that the value of R square on ITG19 is 0.947, it is indicating when there is an increase towards PO6, DS5, DS11, DS12, it can affect ITG19 by 94.7% while the rest is the influence of other variables that are not included in research models. Furthermore, the value of R square on BG12 is equal to 0.312, indicating when there is an increase to ITG19, it can affect the BG12 by 31.2%, while 68.8% is the
influence of other variables which is not included in the research model.

**Table - 7. R square of Latent Variable**

| Latent Variable | R square |
|-----------------|----------|
| ITG19           | 0.947    |
| BG12            | 0.312    |
| PO6             | 0        |
| DS5             | 0        |
| DS11            | 0        |
| DS12            | 0        |

Based on table - 8. Path Coefficient indicates that the entire hypothesis is accepted.

**Table - 8. Path Coefficients**

| Path Coefficients | Estimate | SE   | CR   |
|-------------------|----------|------|------|
| ITG19->BG12       | 0.558    | 0.079| 7.09*|
| PO6->ITG19        | 0.532    | 0.152| 3.49*|
| DS5->ITG19        | 0.669    | 0.276| 2.43*|
| DS11->ITG19       | 0.087    | 0.117| 2.74*|
| DS12->ITG19       | -0.406   | 0.143| 2.84*|

**CONCLUSION**

Cobit Mapping of IT Processes (PO6, DS5, DS11, and DS12) and ITG19 were significant in this case study. These relevance mapping, linking with maturity level, show that IT Process of DS11 and IT Process 12 have to be increased by following Control Objectives on Cobit 4.1 framework.

**FUTURE RESEARCH**

There are a lots of variables on COBIT framework that can be developed as a model to follow the development of case study. This research model is also can be tested on different case study in order to know if there is any difference result.

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