AUDIT OF IT PROCESS DS-11 FOR ACADEMIC INFORMATION SYSTEM BASED ON FRAMEWORK COBIT 4.1

Audit Tata Kelola IT Process ds-11 “manage data” pada Sistem Informasi Akademik menggunakan Framework COBIT 4.1

Rendra Trisyanto Surya
Politeknik Negeri Bandung (D4 – Akuntansi Manajemen Pemerintah/Akuntansi)
E-mail: rendratris2013@gmail.com

Jouzar Farouq Ishak
Politeknik Negeri Bandung (D4 – Akuntansi Manajemen Pemerintah/Akuntansi)
E-mail: jouzar.farouq@polban.ac.id


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1. Introduction

Today, the universities increasingly depend on the use of Information Technology. One of the application of Information Technology in Higher Education is Academic Information System (SIAk). SIAk has an important role in providing information to various parties, ranging from Administration, Students, Lecturers, Structural Officers until to Top Management. In the Academic Information System there are element that collect large amounts of data arranged systematically that called a Database. Mutyarini and Sembiring's research (2006) shows that private universities in Yogyakarta manage its Academic Information Systems based on technical and internal IT Management paradigms, so they are not aligned with organization goals. Research by Lidya Julinita (2009) is also concludes that IT Process DS-05 and DS-11 from SIAK in Higher Education in East Java are still at a low IT Maturity Level, which is 1.46 point. That is, Governance of the Database of Academic Information Systems (SIAk) is generally not systematic and organized and has refered to Best Practice.

Database (Manage Data) is the 'blood' for the smooth process and function of the Academic Information System. Therefore, it is necessary to evaluate the effectiveness of IT Control on the Database Management of SIAK in Higher Education. The Top Management of Higher Education is also needs to know how much maturity level the Database Management System is measured based on the IT Process DS-11 "Manage Data" which refers to the IT Framework COBIT Version 4.1 to estimate the effectiveness of future IT Plans related to IT Governance in SIAK.

Based on the new approach of IT Governance that the Database Management System from SIAK must be integrative, comprehensive and "aligned with the business". Business is this meaning: must be in line with the goals and mission of the University. Management of the IT Process DS-11 may not only be a matter of the department / computer department alone (IT Function) technically as a old paradigm. The new paradigm states that database management must involve all relevant parties, both those who act as "Data Owners" and as "Business Owners" are outside of IT Department.

2. Literature Review

Sistem Informasi Akademik (SIAK) may not function properly if they are not supported by various elements such as IT Hardware, IT Software, Procedures, Brain ware, IT Infrastructure and Databases. Although "Database" is only one element, it is strategic because it is a collection of large amounts of data and information that determines the performance of the entire organization of a tertiary institution. But on the other hand, as is the inherent risk of Information Technology, it always holds various potential risks (problems). Starting from the simple to the serious, if not handled properly (Preventive Control). Then it will quickly undermine the role of IT as an enabler of an organization. Only through “mature” IT Governance-based IT Management can various hidden IT risks be systematically mitigated. Information Technology Governance (Information System), is defined as: the process of continuous organizational management control of information system resources, where these resources include computer resources such as software, brawnare, databases and so on, to various IT Network LAN Infrastructure / Internet.

3. Research Method

This study based on qualitative research with Case Study approach which collects data
through questionnaires and interviews. The Qualitative-Descriptive Data is then converted into quantitative so that it can be categorized into data maturity level by using the Surendro Scoring Model Calculation Technique (Kridanto Surendro, 2009). The Case Study suggestion because it is only based on data from nine universities in the city of Bandung, which are randomly selected and accepted to fill in the questionnaire. Data is taken from respondents who work related to Academic Information System (SIAK) in their Higher Education Institutions. Answering consisted of head office staff (Deans) and also head of Department as a sample, including Lecturers and Students around. While from the "IT function" the respondents are the staff or the Head of Information System Planning, the Head of BAAK, the System Administrator and the IT / DEO Operator.

4. Result and Discussion

The analysis starts from the results of the questionnaire by identifying risk of IT Process DS11 SIAK in each College with reference to the "Detailed Control Objective (DCO)" of the COBIT. Control Objectives to the effectiveness of the implementation of the DS-11 are consists of 13 Detailed Control Objectives as follows:

1. Are following the effective procedures for managing Database preparation
2. Is there authorization of source documents that valid processed by the Academic Information System (SIAK)
3. Does the method and procedure for collecting source documents be used for Database systematically
4. Is it carried out following a clear error handling mechanism
5. Is there a method of destroying source documents for sensitive data
6. Is there a procedure for entering data into the SIAK
7. Is there authorization for data completeness and accuracy
8. Is there an error handling of SIAK data processing activities
9. Is there an editing and validation process method
10. Is there a mechanism for distributing information / reports
11. Are there methods and systems for protecting sensitive data
12. Is there a mechanism for making data backup (backup) and restoration

The recapitulation results for those questions are described as in Table-2. These are the analysis of those data:

a. Overall, as many as 27% of respondents examine that the DS11 of IT Process performance level was still at the Low level of compliance.

b. Only 17% of respondents said that the database management system ran well and met the expectations of COBIT.

c. Partially, as many as 42% of respondents examine that the performance of media library handling is still "Low" compliance. Handling of damaged or unused media is often incomplete activities. This causes the risk for sensitive data often leaves traces that has the risk potential to be raised again by using certain "tools" and being misused.

d. As many as 47% of respondents consider that backups to a database are important but in fact the management has not done it systematically. Even backup media that are used often
do not use adequate quality security, so physical damage that occurs can cause serious problems for halt. The effectiveness of the backup procedure is 20% only occurs in the Top Management work environment.

Based on the Performance can be analyzed as follows:

a. DCO of DS-11 as a whole has an Average Value of 1.7. That is, the management process of DS-11 is largely not based on COBIT.

b. What is considered important related to IT Process DS-11 is limited to how the handling of "DATA Security" for considered usual (with a performance value of 2.2). This means that the data considered to be not sensitive can be accessed easily by employees, lecturers, and even students.

The overall performance value of the IT Process DS-11 is still low (with a total value of 1.7). This situation has the potential to IT Risk (if there is a Threat) in the management of SIAK. This situation shows quite a lot of residual risk that has not been managed properly. There are only two DCOs whose achievements are quite good and their performance value is at the Medium level.

From the questionnaire in Part-B which is created intended to measure the Maturity Level of the IT Process "Manage Data" (DS-11) based on the "Current (as is)" condition and what is desired by the respondent (To-be) can be analyzed as follows:

1. Based on the CURRENT condition (as is) most of the respondents, as many as 44% gave answers c. That is, assessing that the maturity level at the "Repeatable but Intuitive" which by COBIT definition is at level-2. Conditions that indicate that Higher Education in Bandung has had a recurring pattern (system) in managing DATABASE at SIAK. However, the management has not been systematically defined.

2. In the answers to the future-oriented "to be" questions desired, the majority of respondents, as many as 56.7% want the management of the IT Process DS-11 to be much better for the future by choosing the answer f. Which in COBIT means there is already a high awareness so that the problem of "Manage Data" in the future can be increased to reach Level-5 (Optimistic).

This study also shows that most respondents had "expectations" (to-be) of 24.8%, and answer point f of 56.7%). This indicates the following important finding things:

- There is awareness of achieving good data management system for the future in all lines of the organization that relating to the Academic Information System (SIAK)
- Desire to form data ownership responsibilities (Data Owner) that more clearer than the current conditions (now)
- Data handling procedures in SIAK need to be formalized and disseminated to related parties.
- Staff training related to data handling is still needs to be improved better.

5. Conclusion

According to the maturity model and consider the maturity of several other attributes as Table-4 and Table-5, we conclude as below:
1. “Current” Maturity Level (As is) for DS-11 IT Process Governance at the SIAK of Higher Education in Bandung as overall is at LEVEL-2. It means that the IT management process that is carried out is "Repeated". But the Maturity Value is 2.4 which shows it is in the management process to go to maturity at Level-3.
2. While the “Expected” Maturity Level (Awareness) is to the Level 4. It means the Higher Education in Bandung has very high awareness to be prepared to go to a higher level.

References

“COBIT and The IT Governance Institute”, www.researchgate.net
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Surendro, Kridanto. (2009). Implementasi Tata Kelola Teknologi Informasi, Penerbit Informatika, Bandung

Appendix

Tabel-2
### No Detailed Control Objective (DCO) | L | M | H
--- | --- | --- | ---
1. | Efektivitas Sistem Management Data | 7% | 84% | 9%
2. | Prosedur Kemudahan Penyimpanan dan akses media | 18% | 69% | 13%
3. | Aspek integritas dan keamanan data | 38% | 44% | 18%
4. | Penanganan Media Library | 42% | 44% | 13%
5. | Keamanan data sensitif setelah disposal (dibuang) | 40% | 47% | 13%
6. | Prosedur *Backup* dan *Restore* | 16% | 53% | 29%
7. | Pengujian efektivitas *Backup* dan *Restore* | 47% | 33% | 20%
8. | Keamanan data sensitif | 36% | 53% | 11%
9. | Penanganan insiden permasalahan pada media backup | 42% | 47% | 20%
10. | Keandalan sistem saat proses pemulihan dilakukan | 24% | 53% | 22%
11. | Kepuasaan terhadap ketersediaan data setelah restorasi | 16% | 58% | 27%
12. | Keamanan akses terhadap data sensitif | 20% | 47% | 33%
13. | Insiden kapasitas tidak mencukupi dan integritas data | 27% | 60% | 13%
14. | Tingkat keandalan proses pemulihan data sensitif | 20% | 67% | 13%
15. | Kepuasaan terhadap ketersediaan data | 20% | 62% | 18%
16. | Kepatuhan terhadap aturan penggunaan data | 16% | 78% | 7%

**RATA_RATA Tk Kinerja IT Process DS11**

![Tabel-3 “Nilai Kinerja IT Process DS11 Perguruan Tinggi”](image-url)

### No Detailed Control Objective (DCO) | L | M | H | Nilai Kinerja
--- | --- | --- | --- | ---
1. | Adanya Sistem Management Data | 10% | 90% | 0% | 1,9
2. | Prosedur Kemudahan Penyimpanan dan akses media | 50% | 40% | 10% | 1,6
3. | Aspek integritas dan keamanan data | 50% | 40% | 10% | 1,6
4. | Media Library | 70% | 20% | 10% | 1,4
5. | Keamanan data sensitif setelah disposa | 60% | 40% | 0% | 1,4
6. | Prosedur *Backup* dan *Restore* | 30% | 60% | 10% | 1,8
7. | Pengujian efektivitas *Backup* dan *Restore* | 40% | 50% | 10% | 1,7
8. | Keamanan data sensitif | 30% | 50% | 20% | 1,9
9. | Penanganan insiden terkait efektivitas media backup | 70% | 30% | 0% | 1,3
10. | Keandalan sistem saat proses pemulihan | 30% | 60% | 10% | 1,8
11. | Kepuasaan terhadap ketersediaan data setelah restorasi | 40% | 40% | 20% | 1,8
12. | Keamanan akses data sensitif | 10% | 60% | 30% | 2,2
13. | Penanganan insiden terkait kapasitas tidak mencukupi dan integritas data | 40% | 60% | 0% | 1,6
14. | Tingkat keandalan pengelolaan pemulihan data sensitif | 40% | 50% | 10% | 1,7
15. | Kepuasaan terhadap ketersediaan data | 10% | 80% | 20% | 2,3
16. | Kepatuhan terhadap hukum / aturan terkait dengan penggunaan dan manajemen data | 0% | 90% | 0% | 1,8

**RATA_RATA Tk Kinerja IT Process DS11 Manage DATA POLBAN:**

1,7
Picture-1: “Tingkat Pencapaian DCO IT Process DS11”
### Tabel-4 “Maturity Level IT Process DS11 Perguruan Tinggi”

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<td></td>
<td></td>
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<tr>
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<td></td>
<td>to be</td>
<td>0,0%</td>
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<tr>
<td></td>
<td></td>
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</tr>
<tr>
<td></td>
<td></td>
<td>to be</td>
<td>0,0%</td>
</tr>
</tbody>
</table>

|       | SAAT INI |      | 5,0%  | 17,4% | 44,0% | 22,3% | 11,3% | 0,4% |
|       | TO-be    |      | 0,4%  | 0,7%  | 5,0%  | 12,8% | 24,8% | 56,7% |

### Tabel-5 “Nilai Kematangan dan Level Kematangan IT Process DS-11”

<table>
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<td>4,2</td>
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<td>4,3</td>
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<td></td>
<td>Rata-rata</td>
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<td>4,3</td>
</tr>
</tbody>
</table>
Nilai dan Kelas Kematangan IT Process DS11 "Manage Data" Pendidikan Tinggi

Picture-2 “Nilai dan Level Kematangan DS-11 ”