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

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Abstrak: *Database (Manage Data) merupakan proses penting dari suatu pengelolaan Sistem Informasi Akademik (SIAK). SIAK dewasa ini menjadi tolok ukur terhadap ukuran kinerja suatu organisasi Perguruan Tinggi. Namun, di sisi lain, secanggih apapun Teknologi Database yang digunakan, dan sebaik apapun Sistem Manajemen Database yang diterapkan, selalu ada IT Risk yang tersisa (Residual Risk) yang harus diwaspadi karena memiliki dampak yang serius. Rendahnya sebagian besar tingkat kematangan Tata Kelola SIAk secara keseluruhan di Perguruan Tinggi di Jawa Timur, menurut penelitian Mutyarini Cs dan Lidya J , yaitu sebesar 1,4. Menyebabkan perlunya juga dilakukan penelitian khusus terhadap salah satu elemen penting SIAK, yaitu DATABASE. Database menurut COBIT, harus dikelola pula (sebagaimana IT Process lain), berdasarkan Control Objective yang telah ditetapkan untuk IT Process DS-11 (Manage Data). Karena rendahnya Level Kematangan SIAk tersebut, menunjukkan terdapat beberapa IT Risk yang bisa berdampak serius terhadap keakurasian data. COBIT Control Objective for IT and its related) merupakan salah satu IT Framework terbaik saat ini yang telah menjadi Best Practice ("accepted"), karena keakurasiannya didalam memetakan IT Risk dan menetapkan control yang sesuai dari berbagai IT Process didalam suatu organisasi. Dari hasil penelitian ini diperoleh hasil. Bahwa Perguruan Tinggi di Kota Bandung juga umumnya masih mengela Database dari Sistem Informasi Akademik pada Level Kematangan 2, yaitu "Repeatable but Intuitive". Artinya, sudah dilakukan berdasarkan manajemen yang terpola, namun belum sistematis (defined). Banyak keputusan terkait "Manage Data" yang dilakukan secara spontan dan responsif berdasarkan situasi yang ada saat. Sehingga disimpulkan, bahwa masih cukup banyak IT Risk di dalam pengelolaan database dari Sistem Informasi Akademik (SIAK) di beberapa Perguruan Tinggi di Kota Bandung, yang belum ditangani dengan sistematis dan efektif.*

Kata kunci: *tata kelola IT, IT risk, IT process, level kematangan*

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 Jualinita (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 Planniing, 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 DS-11 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-11as 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.

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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 restorasi	47%	33%	20%
8	Keamanan data sensitif	36%	53%	11%
9	Penanganan insiden permasalahan pada media backup	42%	47%	11%
10	Keandalan sistem saat proses pemulihan dilakukan	24%	53%	22%
11	Kepuasaan terhdp 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	Kepuasan terhadap ketersediaan data	20%	62%	18%
16	Kepatuhan terhadap aturan penggunaan data	16%	78%	7%
	RATA_RATA Tk Kinerja *IT Proces* DS11	**27%**	**56%**	**17%**

Tabel-3 "Nilai Kinerja IT Process DS11 Perguruan Tinggi"

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 disposal	60%	40%	0%	1,4
6	Prosedur *Backup* dan *Restore*	30%	60%	10%	1,8
7	Pengujian efektivitas Backup dan restorasi	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 terhdp ketersediaan data setelah restorasi	40%	40%	20%	1,8
12	Keamanan akses data sensitif	10%	60%	30%	2,2
13	Penangaan 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	Kepuasan terhadap ketersediaan data	10%	80%	20%	2,3
16	Kepatuhan terhadap hukum/aturan terkait dengan penggunaan dan	0%	90%	0%	1,8
	manajemen data				
	RATA_RATA Tk Kinerja *IT Proces* DS11 Manage DATA POLBAN:				1,7
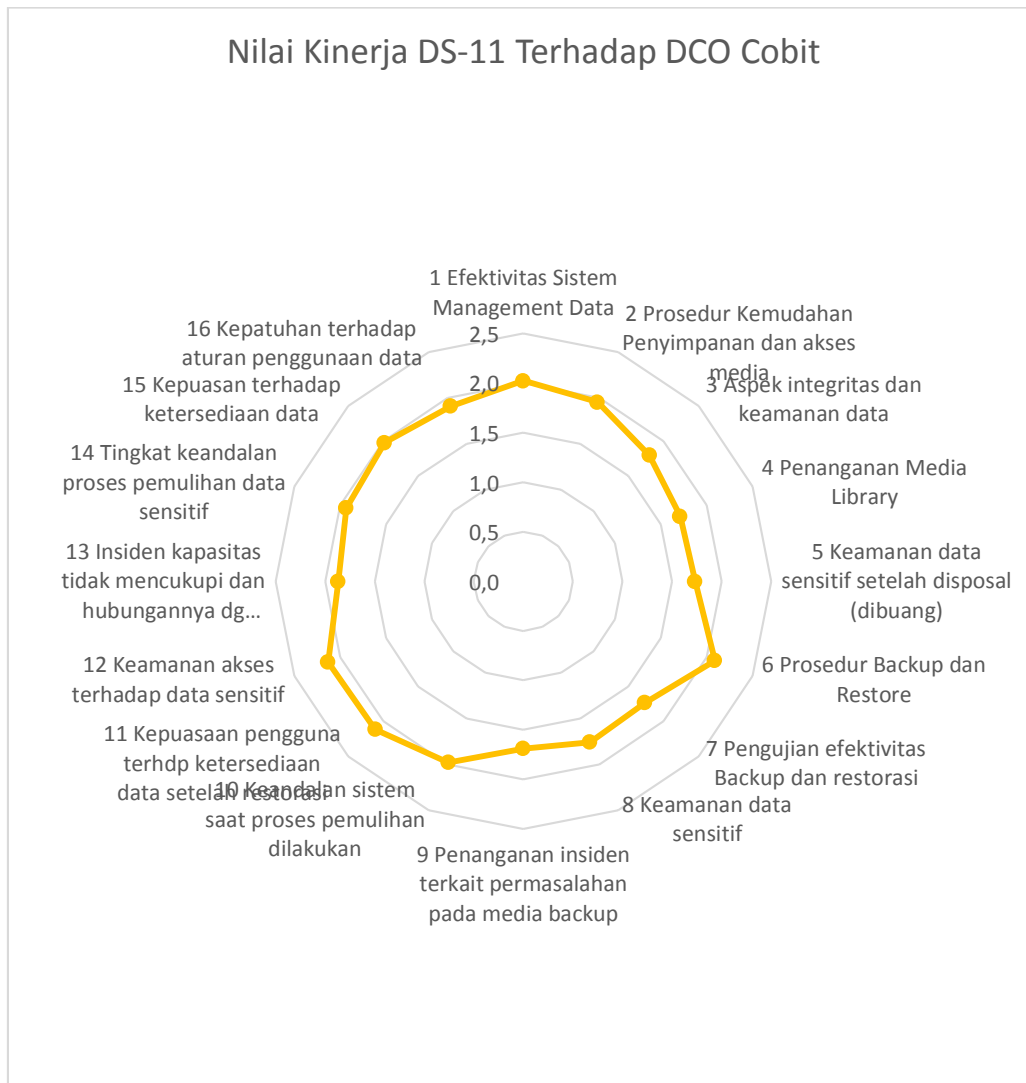
Picture-1: "Tingkat Pencapaian DCO IT Process DS11"

Tabel-4 "Maturity Level IT Process DS11 Perguruan Tinggi"

No	Atribut Aspek	Status	Distribusi JAWABAN					
			a	b	c	d	e	f
1	AC	as is	17,0%	34,0%	19,1%	25,5%	4,3%	0,0%
		to be	2,1%	4,3%	10,6%	14,9%	25,5%	44,7%
2	PSP	as is	2,1%	12,8%	46,8%	21,3%	17,0%	0,0%
		to be	0,0%	0,0%	2,1%	10,6%	23,4%	63,8%
3	TA	as is	2,1%	14,9%	34,0%	29,8%	19,1%	2,1%
		to be	0,0%	0,0%	6,4%	6,4%	23,4%	63,8%
4	SE	as is	4,3%	8,5%	66,0%	17,0%	4,3%	0,0%
		to be	0,0%	0,0%	4,3%	17,0%	23,4%	55,3%
5	RA	as is	0,0%	19,1%	36,2%	27,7%	17,0%	0,0%
		to be	0,0%	0,0%	4,3%	8,5%	21,3%	66,0%
6	GSM	as is	4,3%	14,9%	61,7%	12,8%	6,4%	0,0%
		to be	0,0%	0,0%	2,1%	19,1%	31,9%	46,8%
		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"

No.	Atribut	Nilai Kematangan		Tingkat Kematangan	
		As is	*To be*	*As is*	*To be*
1	AC	2	4,3	2	4
2	PSP	2,7	4,4	2	4
3	TA	2,5	4,1	2	4
4	SE	2,1	4,2	2	4
5	RA	2,5	4,3	2	4
6	GSM	2,7	4,3	2	4
	Rata-rata	**2,4**	**4,3**	**2,0**	**4,0**
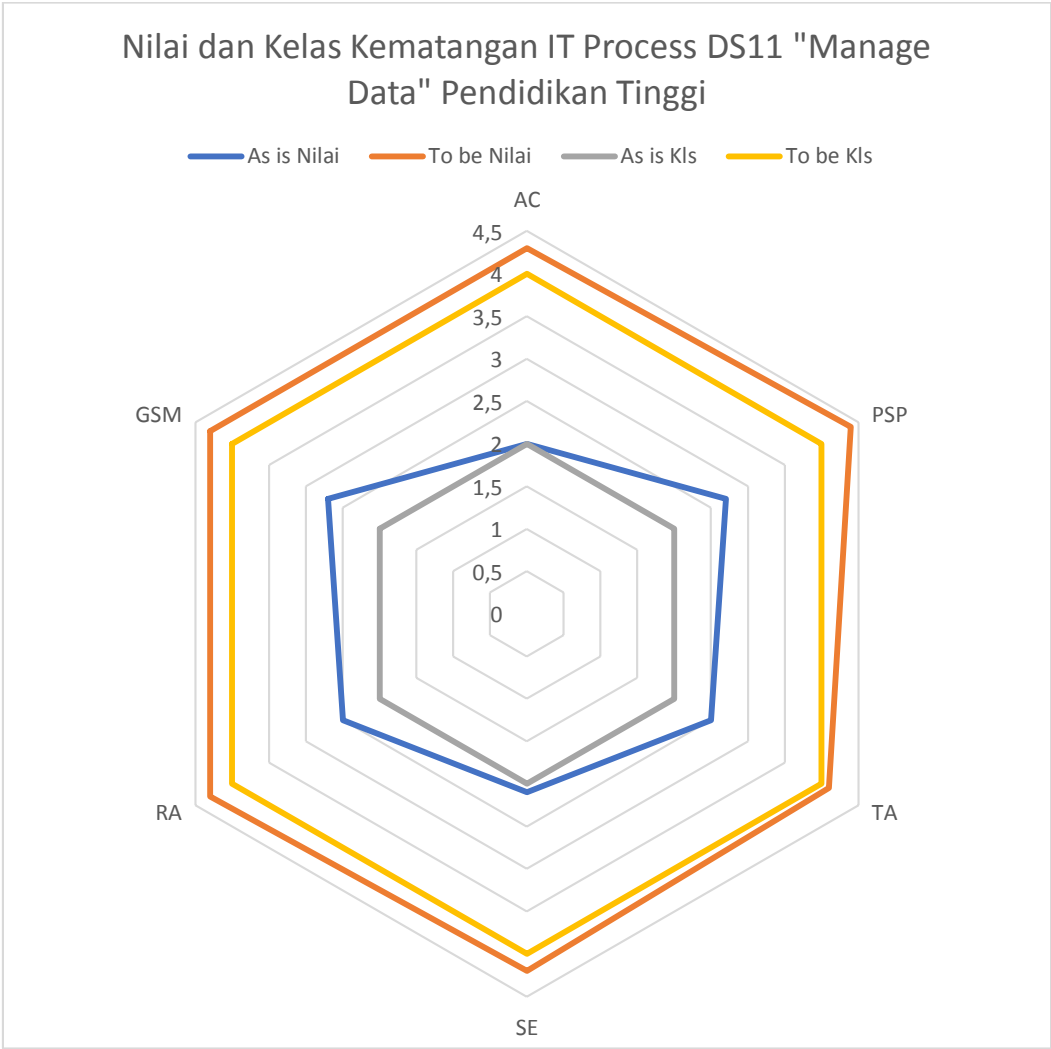
Picture-2 "Nilai dan Level Kematangan DS-11 "