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Assessment for good university governance in higher education focus on align strategy business with it at big data era

Assessment for good university governance in higher education focus on align strategy business with it at big data era

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Abstract. Big Data is era where organization need to prepare because data that always increasing in complexity, variability, velocity, volume and variety. Governance is one of the answer to prepare organization in this era. Good University Governance (GUG) has different core value with government or company. The Purpose of this research are to prepare an assessment for higher education to find out the implementation of Good University Governance (GUG) that has relation with Information Technology (IT) using COBIT 5. The implication of this research is higher education can use this research as basic to assess itself to find out GUG implementation for accountability principle. The combination between GUG and COBIT 5 that focus on align IT with business strategy for accountability principle is the originality of this research.

1. Introduction

Big data is an era for organizations compete with each other to manage employees, software, hardware for extract value of data that has the increasing complexity, variability, velocity, volume and variety [1,2,3,4]. In this case it is necessary to prepare governance for manage organizations in this era of big data [3]. There is a concept about governance know as Good Governance (GG), which is a concept that describes an administration for public goods under modern democratic decision based on freedoms of economic actors and fundamental rights [5].

Good University Governance (GUG) is a concept that derivative from Good Governance that focuses for university (higher education). GCG (Good Company Governance) and GUG is different because there is different core values from company and higher education, where higher education need to focus on social and academic [6][7]. There are 5 basic principles for GUG, this principle is taken from the Law in Indonesia which goal is to manage higher education. The law state that to manage higher education should be based on five principles namely accountability, transparency, nonprofit, quality assurance and effectiveness & efficiency [8]. There is a framework to conduct assessments and improvements at the governance and management level of organizations namely COBIT 5 [8,9]. COBIT 5 (Control Objective for Information & Related Technology) as the name implies, only makes an assessment and provides recommendations for improvements related to IT, therefore this research only focus for IT governance.

IT governance is important to determine the project is success or fail to meet the expectation [11]. This is also support by many research, that found many IT project's not meet the expected value (e.g., budget, profit, time, etc.) [11,12,13]. University also evolve in this era, this evolution lead to many problem specially on IT problem like unmanaged IT risk, hard to align strategic business objectives with institutional, and resource duplication [15][16]. According this problem higher education need to prepare itself in this era using GUG to improve competitiveness and also to have better management quality.

This research is tries to find capability level and percentage of GUG in accordance with the principle of accountability using COBIT 5 framework for IT Governance in aligning business strategy with IT.

2. Methodology

A. Select domain and IT Process

The fist step is to choose place for conduct this research, where in this research is used one of college in Indonesia. This college is used as case study because there is a self-evaluation (internal audit) result that state GUG is needed to implement for improve competitiveness and also for better management. The next process is to identify IT process that need to assess, one of the priority that stakeholder needs according to questionnaire is "How can I best exploit new technology for new strategic opportunities". Researcher then conduct a mapping process to find IT process that have a relation with the stakeholder needs, this mapping process is conduct according to the framework used [10]. There is 10 IT process that has a relation with the stakeholder needs, the IT process is EDM01, EDM02, APO01, APO02, APO03, APO05, APO07, APO08, BAI01, BAI02.

The mapping IT process then adjusted with the IT process in accountability principle because in this research only focus on the principle of accountability only. The IT process for accountability principles here draws from GCG-related research [17], this is because the lack of literature for IT process on COBIT 5 for GUG-related research. The principle of accountability is one of the principles that exist in GG and is a derivative to GUG and GCG because that is the basis of principle is same. From this adjustment result it is known that the 10 previously obtained IT processes are included in the assessment that needs to be done for the principle of accountability. Researcher also determine the expected capability level (To-Be), to determine this, researcher conduct several discussion and interview with the expert that has experience in COBIT 5. The experts are not only had experience in COBIT 5 but also a lecturer in audit course. The result is found that the expected level (To-Be) for accountability principle is at level 3.

B. Conduct an Assessment (As-Is)

The next step is finding the percentage of GUG for accountability principle using formula that already prepare. Weighted mean is a method used for find the implementation result for each sub IT process, for the weighted in this research is use rating from COBIT 5. COBIT 5 have 4 rating scale which are N (Not Achieved), P (Partially Achieved), L (Largely Achieved), F (Fully Achieved). Each rating scale has different value, the value is 1 for N, 2 for P, 3 for L and 4 for F The weight of the value for N is 1, for rating P is 2, for rating L is 3 and the last for F is 4 [17]. Equations 1 is formula used to calculate each sub IT process.

$$WM = \frac{\sum_{i=1}^{n}(X_i * W_i)}{\sum_{i=1}^{n}(X_i * W_{max})} \quad (1)$$

Information:

WM	= Result for weighted mean
n	= Sum of total data that need to calculate
X_i	= Value of dataset for X on the order of i
W_i	= Value Weight for each data on the order of i
W_{max}	= Weight Maximum (Max weight is 4)

Total average implementation is calculate using mean method. Equations 2 is a formula to calculate total average implementation.

$$M = \frac{\sum_{i=1}^{n} x_i}{n} \quad (2)$$

Information:
M = Result for mean
n = Sum of total data that need to calculate
X_i = Value of dataset for X on the order of i

Assessment result for accountability principle is compare with score table that found from another research [17]. The research state that the score divided into 5 types. The category is not good/ineffective (20%-35,99%), less good/less effective (36%-51,99%), good enough/effective enough (52%-67,99%), good/effective (68%-83,99%), and very good/very effective (84%-100%). This research used to measure GCG implementation, but it also can used in GUG because the purpose for the research is to measure the principle in GCG where the principle is a derivative from GG.

3. Result and Discussion

The result for the assessment were found by interviewing and questionnaires for all 10 IT processes. Almost all of IT process at college is level 1 except for EDM 01 and APO 07. Where EDM 01 capability level is 0 and for APO 07 is at level 3. According to COBIT 5 level 1 means the organization already run the IT process and also determine its IT goal [9]. Assessment result shows that the IT process that has assess has 2 level Gap except for APO 07 that has achieved targeted capability level and EDM 01 that has 3 level Gap. Figure 1 is a radar chart (spider chart) to show the gap between the capability level from assessment result (As-Is) with the target capability level (To-Be).

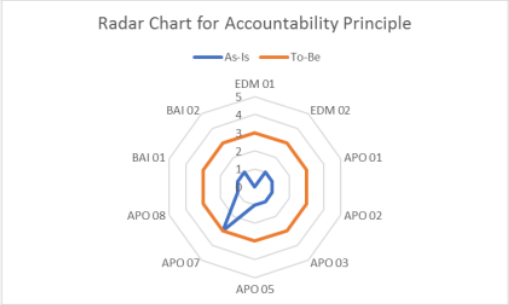

Figure 1. Assessment Result for Accountability Principle

Next process is to find out the implementation result from the college that used as case study. As stated in methodology before to find the result in here researcher using weighted mean method and mean method. Table 1 shows the result for the GUG Implementation using IT process in COBIT 5.

Table 1. GUG Implementation for Accountabilty Principle

GUG Principle	IT Process	Percentage Implementation	Result Implementation
Accountability	EDM01	58.33%	77.22%
	EDM02	81.94%	
	APO01	89.58%	
	APO02	80.00%	
	APO03	77.00%	
	APO05	65.28%	
	APO07	91.20%	
	APO08	75.00%	
	BAI01	78.87%	
	BAI02	75.00%	

The result shows that the college has value 77.22% for accountability principle. This result is high because the important part is level 1 where all IT process need to implement, while level 2 till level 5 is

to manage and improve the IT process. Even the result is high there is still recommendation needed to reduce the existing gap or even eliminate it. There are 3 kind recommendations that given for the college, first is recommendation for level 1 to improve the existing IT process and reduce gap for EDM 01. Next is recommendation for level 2 to manage the IT process that already exist, this recommendation is needed to reduce the gap for 9 IT process that still not level 2 yet. And the last is recommendation for level 3 for adjustments with standards.

There are 45 recommendations in total that need to run so the expected level can be achieved, the detail for this recommendation are 24 recommendations for improving level 1, 10 recommendations for level 2 and 11 recommendations for level 3. The recommendations are separate by level is according to the framework that used , its state that to get the next capability level the previous level need at the fully Achieved (85%-100%) [10].

4. Conclusion

The research found out that 8 from 10 IT process at level 1 and another 2 at level 0 and level 3. The case study college had gap 2 level for 8 IT process, for EDM 01 had 3 level gap and last for APO 07 already achieved the targeted level. The 8 processes have gap 2 level because the IT process already running in case study college but still not manage properly, for EDM 01 is at level 0 because the governance framework setting and maintenance is still not running well in college that used as case study because it's still in the implementation stage. APO 07 already achieved targeted level because the case study collage has a good management which already standardized. The implementation GUG for accountability principle is at 77.22%, it's mean that the college already have a good/effective accountability.

Researcher have some suggestion for future research, first about the recommendation in this research. There are 45 recommendations needs to run according the result of this research, where there is no priority which recommendation needed to run first. According to some research priority is needed to have effective & efficient scheduling and good resources sharing [16,17,18], so in future research priority needed to consider. COBIT 5 also have deficiency that is COBIT 5 recommendation don't have detail explanation for each recommendation. Therefor researcher suggest to combine COBIT 5 with other framework, in example using ITIL (Information Technology Infrastructure Library) for IT service management [21].

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Table 2. GUG Principles

GUG Principles	IT Process	Sub IT Process
Accountability	EDM 01	EDM 01.01 Evaluate the governance system
		EDM 01.02 Direct the governance system
		EDM 01.03 Monitor the governance system
	EDM 02	EDM 02.01 Evaluate value optimisation
		EDM 02.02 Direct value optimisation
		EDM 02.03 Monitor value optimisation.
	APO 01	APO 01.01 Define the organizational structure.
		APO 01.02 Establish roles and responsibilities.
		APO 01.03 Maintain the enablers of the management system.
		APO 01.04 Communicate management objectives and direction.
		APO 01.05 Optimize the placement of the IT function.
		APO 01.06 Define information (data) and system ownership.
		APO 01.07 Manage continual improvement of processes.
		APO 01.08 Maintain compliance with policies and procedures.
	APO 02	APO 02.01 Understand enterprise direction.
		APO 02.02 Assess the current environment, capabilities and performance
		AP002.03 Define the target IT capabilities.
		AP002.04 Conduct a gap analysis.
		AP002.05 Define the strategic plan and road map.
		AP002.06 Communicate the IT strategy.
	APO 03	APO 03.01 Develop the enterprise architecture vision.
		APO 03.02 Define reference architecture.
		APO 03.03 Select opportunities and solutions.
		APO 03.04 Define architecture implementation.
		APO 03.05 Provide enterprise architecture services.
	APO 05	APO 05.01 Establish the target investment mix.
		APO 05.02 Determine the availability and sources of funds.
		APO 05.03 Evaluate and select programmes to fund.
		APO 05.04 Monitor, optimize and report on investment portfolio performance.
		APO 05.05 Maintain portfolios.
		APO 05.06 Manage benefits achievement.

GUG Principles	IT Process	Sub IT Process
Accountability	APO 07	APO 07.01 Maintain adequate and appropriate staffing.
		APO 07.02 Identify key IT personnel.
		APO 07.03 Maintain the skills and competencies of personnel.
		APO 07.04 Evaluate employee job performance.
		APO 07.05 Plan and track the usage of IT and business human resources.
		APO 07.06 Manage contract staff.
	APO 08	APO 08.01 Understand business expectations.
		APO 08.02 Identify opportunities, risk and constraints for IT to enhance the business.
		APO 08.03 Manage the business relationship.
		APO 08.04 Co-ordinate and communicate.
		APO 08.05 Provide input to the continual improvement of services.
	BAI 01	BAI 01 .01 Maintain a standard approach for programme and project management
		BAI01.02 Initiate a programme.
		BAI 01.03 Manage stakeholder engagement.
		BAI 01.04 Develop and maintain the programme plan.
		BAI 01.05 Launch and execute the programme.
		BAI 01.06 Monitor, control and report on the programme outcomes.
		BAI 01.07 Start up and initiate projects within a programme.
		BAI 01.08 Plan projects.
		BAI 01.09 Manage programme and project quality.
		BAI 01.10 Manage programme and project risk.
		BAI 01.11 Monitor and control projects.
		BAI 01.12 Manage project resources and work packages.
		BAI 01 .13 Close a project or iteration.
		BAI01.14 Close a programme.
	BAI 02	BAI 02.01 Define and maintain business functional and technical requirements.
		BAI 02.02 Perform a feasibility study and formulate alternative solutions.
		BAI 02.03 Manage requirements risk.
		BAI 02.04 Obtain approval of requirements and solutions.

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