

## Applying COBIT 5 in Higher Education

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**Abstract.** IT governance framework has emerged as important aspects for all organizations. Organization that has lack of IT governance also experiences lack of good corporate governance. As a result, the organization has difficulties to link its IT benefits to organization's objectives. In some cases, the lack of IT governance even causes severe impacts to school management. The article takes case of a higher institution, STMIK MBM, one of popular IT school in North Sulawesi, that has experienced with frequent IT interruption. The frequent IT interruption has caused severe consequences not only to current school operation, but also to the reputation of the school. In the beginning year of 2017, the ineffective academic data management has caused the severe interruption of school operation and led to the change of school management. To promote IT good governance, the new school director has initiative to apply COBIT 5, as an effective IT governance framework for the school. The article provides an analysis of COBIT 5 implementation with the objectives to provide a reference for major school stakeholders to understand and develop effective business and IT policy. The outcome is expected to provide insight of good IT governance for higher education institution.

### 1.Introduction

Currently, IT Governance has emerged as essential in higher education institutions. Yanosky and Caruso (1) addressed that governance, organization, and leadership were the top 10 strategic issues to determine the university's strategic success. Corporate governance is defined as a term that seems to represent a framework that includes aspects of corporate governance and the business management aspects of an organization (2). Achieving good governance related to corporate strategy and achievement of performance measures, enables the organization to focus on what will be the main driver of business in the future.

Corporate governance refers to overall goal of management and governance with the objectives achieved by aligning strategic and management objectives in line with expectations (3). To keep IT as value added in a higher education institution, it needs to apply IT governance so that all factors and dimensions become synergistic and increases expected return of investment. With IT governance, it is expected that convenience and improved services for stakeholders in higher education environment enables to enhance with the application of IT (4). Leaders and corporate policy makers are required to think creatively to find various breakthrough strategies that can create synergies, which contribute optimally in achieving corporate goals. Therefore, effective information management and efficient use of



technology are needed(5).The article applies COBIT 5 as IT governance framework in a higher education in North Sulawesi, STMIK MBM, to assess the entire business and IT process in that institution.

## **2. Literature Review**

### *2.1.Information Technology Governance (IT Governance)*

IT Governance is a structure of relationships and processes that enables to direct and control an organization in achieving its goals by providing added value when balancing risk by adjusting IT and business processes of the company (7). IT Governance emerged as a bridge between business scope and IT, that enables to narrow gap between the applied technology and accordance with the expected. IT governance is not a separate management, instead of a part of corporate management. The benefits of IT Governance itself are essentially very difficult to quantify because it involves in handling the intangible assets (5).

### *2.2.Corporate Governance is the Company's Strategic Imperative*

Good corporate governance is a mandatory framework for all organizations to survive. Corporate Governance is required to transform the legacy of applications, organizational structures, and fragmented processes (both manual and automated) into an integrated environment with optimal processes responsive to change and delivery of business strategy (6).

### *2.3.COBIT 5 Framework*

COBIT 5 is a comprehensive framework that helps enterprises to create optimal values from IT, by maintaining a balance between realizing benefits, optimizing risk levels and resource use(6). COBIT 5 enables information and relates technology to be governed and managed in a holistic manner for the whole enterprise, taking in the full end-to-end business and functional areas of responsibility, considering the IT-related interests of internal and external stakeholder. The COBIT 5 principles and enablers are generic and useful for enterprises of all sizes, whether commercial, not-for - profit or in the public sector (8).

The COBIT 5 Principles comprised of(8): (1) integrator framework, provides a basis for integrating effective frameworks, standards and other practices. It enables building products from a consistent knowledge base; (2) driven by stakeholder value, refers to stakeholder analysis and the role of governance. COBIT 5 refers to governance is about negotiating and deciding the best interests of different stakeholder values; (3) business focus and context. COBIT focuses on shaping organization goals and objectives. It provides a through and end-to-end enterprise perspective (IT and non-IT business functions). It also enables to link between business information and IT function; (4) enabler-base. COBIT enables shaping scope of governance, roles, activities and relationships; (5) clear distinction between governance and management.

### *2.4.COBIT 5 Process Capability Model.*

COBIT 5 enables to assess the enterprise process capability that comprises of six levels such as(9): (1) level 0: Process incomplete. At this stage the process has no goal to achieve; (2) level 1: The process is done. The process already exists and achieves its own goals; (3) level 2: successful process, is implemented in a series of activities, such as planning, monitoring and adjusting activities. The results are established, controlled and maintained; (4) level 3: a predefined process. This level has process definition and process deployment as attribute; (5) level 4: The process can be predicted. This level implements the process within the specified

limits that enable the achievement of the results of the process. It is known as “process management” and “process control” as the process attribute; (6) level 5: Optimizing process, applies the process in a way that enables achievement of relevant, current and projected business objectives. This level has "process innovation" and "process optimization" as the process attribute. COBIT 5 requires sequential achievement to proceed with higher level.

### *2.5.IT Security*

Beznosov and Besnosova addressed there are three factors that affect the effectiveness of information security control such as (10)(11): (1) human factor, are defined as those related to cognition at the individual level, as well as culture and interaction with others. Adoption of security practices poses several challenges for security practitioners. For example, effective interaction and communication are needed to achieve mutual understanding of security risks among various stakeholders. Kraemer and Carayon (12) define human error as the cause of computer accidents and inhumane but unintentional computer security such as accidental programming errors that cause the computer to crash under certain circumstances (11). A person's attitude and personal factors have a profound effect. In order to run the organization effectively, it needs people who have a high sense of responsibility as well as emotion management; (2) organizational factors, is an aspect related to the organizational structure, including size and managerial decisions surrounding IT security. Kankanhalli et al. (13) proposes a model that links organizational factors such as organizational size, top management support, and types of industries with the effectiveness of information security control in organizations. Based on their studies, they concluded that management support is positively related to the implementation of preventive security efforts. They found that organizations that invested more resources in control to prevent poor security practices, performs better than preventive actions in smaller measures (11). The existence of good management and full support from the leadership to employees can be a good factor in controlling the security of the organization. The article applies the role of organizational factors that enables to reduce the potential risk that can damage the security of campus data; (3) technological Factors, involves technical solutions such as applications and protocols. Audestad(14) explains that one reason for not achieving 100 percent security is due to the complexity of the technology. This complexity makes it very difficult for decision makers to manage the big picture and design a security policy that covers all possible system configurations. Jiwnani and Zelkowitz (15) describe system security testing as a long, complex, and expensive process. They propose a taxonomy to classify vulnerabilities and help security practitioners in prioritizing resources to improve them (11). Provision of resources whether human resources or equipment that support operations must be in accordance with current state of technology.

COBIT as an IT management model, applies two major internal control models such as: holistic operating control model and focusing on the IT control model. COBIT provides a high-level guide to IT resources, including data, applications, techniques, hardware and personnel. It enables to achieve organizational goals through risk balancing and direction and control measures (16).

### **3. Research Method.**

The article applies COBIT 5 framework in a school of computer that located in North Sulawesi, STMIK MBM. The STMIK MBM is established on the 2003, and has become one of the popular schools in North Sulawesi. The data gathering method comprises of observation

and interviews to major stakeholders in managerial levels and above, such as: secretary and head of programmers, directors, CEO of the school, and school managers including IT manager. There are total 12 persons were involved as major respondents. The data gathering also involves with the plan of the school to deliver e-learning system that enriches learning experiences.

#### 4. Results and Findings.

Based on the results of interviews and findings, all respondents agree that reviews to entire business process and IT system need to be taken to ensure to accommodate the needs of all stakeholders (redesigning academic system), and preparing for developing e-learning application. Further observation and focus group discussion have been conducted to address the findings.

##### 4.1. COBIT 5 for IT governance in higher education.

The use of COBIT 5 framework addresses two main areas such as: governance and management areas. The governance area has a domain that consists of 3 main processes/activities such as: evaluation, direction, and monitoring (EDM)(4)(17). The use of EDM domain that is used IT governance in colleges is summarised in table 1.

**Table 1.** Evaluate, Direct, and Monitoring (EDM) Process Mapping.

No. Process	Process	Description	Goals and Processes
EDM01	Ensure there are governance arrangements and maintenance frameworks.	Analyzes the need for IT governance at STMIK MBM and regulates IT governance processes and practices appropriately supported by the vision and mission the organization.	Provide a good IT governance system with ongoing system analysis. This is made to ensure and oversee the processes such as current learning management system, and academic and staff resource management, etc. associated with IT, must truly have their effectiveness in line with the vision and mission.
EDM02	Ensuring profit	IT governance planning done to manage investment in IT can be a profit center instead of cost center.	The existence of investment in the IT field, must be efficient in terms of cost and time. Evaluation needs to be made to examine the overall IT investments and current business process, to ensure they will deliver benefits as expected.
EDM03	Ensure risk optimization	Ensure IT management is used to understand and minimize risks that will occur both internally and externally.	Ensure that the risks analyzed can be addressed. Current risks such as slow access to intranet, data integrity, and IT security issue should be well identified and managed to minimize errors in IT governance.
EDM04	Ensure resource optimization	Ensure the availability of adequate resources, people and processes and can manage IT governance well with respect to cost efficiency.	Ensuring the need for resources (people training, enhancing business process, update IT technology) can adapt to changing management (expectation) and school's objective to implement e-learning system.
EDM05	Ensure transparency to stakeholders	Ensure that IT governance must be transparently reported to stakeholders and overseen the management process.	Ensure good communication with stakeholders (collaboration system and director's dashboard) and report on IT governance processes (reporting system) in accordance with existing regulations and in line with campus strategy (ie. comply with accreditation and DIKTI report, and financial reports).

#### 4.2. Implementation of IT Governance.

The observation and focus group discussion results show that major business processes are still documented manually. It may pose high risks, and prone to data lost or damaged. All respondents agree the inaccurate data management relates to high students/staffs' complaints.

**Table 2.** EDM03 Activity Mapping.

No. Activity	Name Activity	Corporate Governance Activities
EDM03.01	Evaluate the risk of data processing manually.	Make a list of risk and application of student data processing application systematically to reduce student data loss risk.
EDM03.02	Evaluate student data processing process.	Migrating the management of student data from manual to systematic by utilizing the use of IT.
EDM03.03	Evaluate the use of student data processing application program.	Supervise and evaluate the process of student data processing systematically as well as maintenance system to be adjusted with current technology development.

**Table 3.** EDM04 Activity Mapping.

No. Activity	Name Activity	Corporate Governance Activities
EDM04.01	Evaluate resource management.	Monitoring and determining what resource requirements are currently required based such as key performance index (KPI), and link it with resource development. The KPI design is also used to reviewing the school policy and objectives.
EDM04.02	Direct the resource management.	Train and direct human resources also set other resource specifications to suit the needs of student data processing.
EDM04.03	Monitor resource management.	Observe and analyze the work performance of existing resources so that later can be reported and can be changed, such as reporting to director's dashboard.

Based on the table 2 and 3 above, we can derive some of the more detailed activities in governance implementation, such as illustrated in table 4.

**Table 4.** Activity table and remedial steps taken on STMIK MBM.

No. Activity	Activity on COBIT 5	Step improvement activity in STMIK MBM
EDM03.01	Make a list of risk and application of academic data processing application systematically to reduce student data loss risk.	Developing risk management procedure to avoid loss in the academic data.
EDM03.02	Migrating the management of academic data from manual to systematic by utilizing the use of IT.	The design of academic data processing system should be adjusted to the needs and operations in organisation. The effectiveness of risk management is necessary to avoid design and efficient errors in terms of cost and time.
EDM03.03	Supervise and evaluate the process of academic data processing systematically as well as maintenance system to be adjusted with current technology development.	Evaluation of the process of using academic data processing system should be done periodically to see if there are errors in the program so that it can be repaired immediately.
EDM04.01	Monitoring and determining what resource requirements are currently required based on the results of the analyzes that have been conducted and should be in accordance with existing rules and taking into account the effectiveness and efficiency of IT governance objectives.	Make a list of the needs of all available resources to support the smooth operation of the use of academic data processing system. Equipment to support the course of the program must be provided with complete and in accordance with the needs.

EDM04.02	Train and direct human resources also set other resource specifications to suit the needs of academic data processing.	Human resources in STMIK MBM must be trained properly in order to use the program and perform the task properly. Fulfillment of resources needs to be adjusted to budgeted costs.
EDM04.03	Observe and analyze the work performance of existing resources so that later can be reported and can be changed.	Problem solving that occurs during the running of the campus operations by using a systematic application program, must be resolved immediately and must continue to monitor the performance of existing resources.

## 5. Lesson Learned and Discussion

The use of IT governance framework, COBIT 5 in STMIK MBM has delivered positive impacts where all major stakeholders enable to develop effective assessments and further implementation plan. The case of inaccurate academic student data that happened in the beginning year 2017, has attracted the attention of school director to apply COBIT framework. With its popular reputation of its application in the industries, COBIT 5 has emerged as an important reference to IT governance in higher education institution, and enables to provide seemingly integration of good governance system of education, business and IT system. The COBIT 5 addresses the advantages of IT for operations that creates efficiency in terms of cost and time in higher education as good as in the business. Significant changes have been made to migrating from manual data processing system to systematic academic system, and especially in delivering e-learning system. To anticipate the occurrence of IT and business risks, the COBIT 5 framework facilitates the leaders of the school to develop effective risk management policy that applies to major school stakeholders.

## 6. Conclusion

COBIT 5 framework as an effective IT governance framework enables to provide good reference for STMIK MBM. COBIT 5 enables to address the issues of IT and business integration that frequently creates major problems in the school. COBIT 5 has advantages to provide effective guidance and strategies in STMIK MBM with several benefits such as providing a good solution in business and IT governance, analyzing and delivering resource performance, and creating IT governance can maximize and deliver time and cost benefits. There are 3 important factors that determines the success of COBIT implementation, such as: human, organization and technology. Those three factors enable to lower the security risk in data management, improve IT service and access for all stakeholders.

## 7. References

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