

# Information Technology Governance Process Capability Level at ABC Company (a State-Owned Enterprise in Indonesia)

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**Abstract—** *Information technology (IT) at ABC Company plays an important role in supporting the operational functions of all its subsidiaries. Therefore, IT must be well managed to achieve company goals. In this research, the IT governance capability at ABC Company is evaluated using a COBIT 5 framework focusing on the pain points encountered at ABC Company. Evaluation results show that the IT governance capability process at ABC Company has achieved level 2 (managed), indicating that the IT governance processes are largely performed and managed, but most of the process has not yet been established. Recommendations for improving the process focus on achieving the short- and long-term targets based on best practices of COBIT 5 activities.*

**Keywords—** *IT Governance; Audit; COBIT 5 Framework; Process Capability Level*

## INTRODUCTION

ABC Company and its subsidiaries (hereinafter, ABC Company) are state-owned enterprises committed to providing the best financial services for their customers and clients. ABC Company plays a strategic role in the growth of small and medium enterprises in Indonesia. For an established company such as ABC Company, with thousands of customers and clients, information technology (IT) plays an important role in business operations and continuity. The information technology must be well managed to help the company achieve its organizational goals.

As a state-owned enterprise, ABC Company requires good IT governance to efficiently manage IT resources within the organization to accomplish company objectives. This requirement is stipulated in the Regulation of the Indonesia Minister of SOE PER-02/MBU/2013 on Guidelines for Information Technology Management of State-Owned Enterprises. IT governance has become a very important requirement for large, small, public, and private companies to improve performance effectiveness and efficiency [1]. IT governance will create added value by mitigating IT risks while achieving company [2]. Although ABC Company has centralized its IT governance in accordance with the ISACA's Control Objectives for Information and Related Technologies, there have still been several recurring problems, such as IT projects that continue to fail due to poor project planning and the company's ever-changing business strategy. Other problems include below-target budget absorption, continually

decreasing performance in handling IT incidents, as well as problems related to the availability of skilled IT human resources to handle the IT projects and technical activities for application developments. Sudarsan Jayaraman [3] states that if the organization has implemented most of the COBIT 4.1 controls but is still experiencing recurrent IT processing failures resulting in IT-related issues, it is time for the company to switch to COBIT 5 to manage IT. In addition, there are also other issues that can require companies to migrate from COBIT 4.1 to COBIT 5, such as communication problems with the IT division, management reporting issues, end-user responsibility issues, supplier support issues, and accountability issues among IT staff.

The preliminary step for COBIT 5 migration is to identify the major problem areas within the organization, then conduct an assessment to identify the status and capabilities of the current process of IT governance [3]. This paper identifies ABC Company's problem areas and evaluates the current process capability level of the company using COBIT 5 self-assessment tools. The capability measurement will produce preliminary knowledge of current IT governance conditions at ABC Company, then give appropriate recommendations to address issues previously unavailable in the COBIT 4.1 framework. Recommendations for COBIT 5 process improvements will be prioritized as determined in the focus group discussion. Prioritizing this recommendation is necessary because ABC Company has limited IT human resources. It is expected that with these recommendations, IT management-related activities within the organization would become more efficient and effective.

## LITERATURE REVIEW

### A. Information Technology Governance

The IT Governance Institute [1] defines IT governance as a part of corporate governance to ensure IT within the organization supports organizational strategy and objectives. IT governance is the responsibility of the board of directors and the executive management. Another definition from Wim Van Grembergen [4] states that IT governance aims to ensure alignment amongst business and IT. IT governance's purpose is to control the implementation of IT strategy, and it needs the role of leaders, executive management, and IT managers.

Van Grembergen definition states that IT management and IT governance are two different concepts [5]. IT management aims to ensure effective IT services by providing and managing IT services and products, while IT governance has a much broader goal, focusing on the implementation and transformation of IT to meet business and customer demand.

IT governance should not be considered separate from IT management, because IT is related to other major company assets (financial, human, intellectual property, etc.) [6]. IT governance must follow the principles of corporate governance (effective, transparent, and accountable), as defined by the IT Governance Institute. IT governance reflects the broader principles of corporate governance, while focusing on managing and using IT to achieve company performance goals.

### B. Control Objectives for Information and Related Technology (COBIT)

COBIT is a governance framework that was developed in 1996 by the Information Systems Audit and Control Association (ISACA) and IT Governance Institute (ITGI) as a tool for management to understand the operations of IT, in order to increase organizational benefits. The COBIT 5 Framework is a strategic evolution of COBIT 4.1, published in 2012 by ISACA. COBIT 5 is different from the previous version because it has a new model assessment, the Process Capability Model, referring to ISO / IEC 15504. The new COBIT 5 assessment model makes the company more focused on the ongoing IT governance process to achieve the company's strategic objectives.

#### 2.2.1 Comparison of COBIT 4.1 and COBIT 5

COBIT 4.1 and COBIT 5 have their respective advantages, which are generally used as a framework for understanding the current state of IT in the organization. The comparison can be seen in Table I.

#### 2.2.2 COBIT 5 Process Reference Model

The COBIT 5 process reference model consists of five domains divided into governance and management, with a total of 37 IT processes, including: Evaluate, Direct, and Monitor (EDM) domain in the governance area; as well as Align, Plan, and Organize (APO); Build, Acquire, and Implement (BAI);

Deliver, Service, and Support (DSS); and Monitor, Evaluate, and Assess (MEA) in the management area. The 37 processes are shown below.

#### 2.2.3 COBIT 5 Process Assessment Model (PAM)

The Process Assessment Model consists of two dimensions, capability and process. This means that in each of the COBIT processes (EDM, APO, BAI, DSS, MEA), there are six levels of capability from level 0 to level 5, as shown in Figure 2.

COBIT 5's six capability levels are explained below:

##### Level 0: Incomplete Process

This implies that the process is not actualized or has failed to accomplish its process goals. There is next to zero proof of achieving systematic process objectives at this level.

##### Level 1: Performed Process

This means that the process has been implemented and successfully achieved process objectives, outcomes, basic practices, and work products based on the COBIT process. Although the process has implemented, there is evidence of lack of standards or planning and still rely on the individual ability.

##### Level 2: Managed Process

This implies that the work products have been well implemented, properly controlled, defined, and kept up to meet the targets of the procedures. The process is also implemented and well managed (planned, monitored, and adjusted). The difference between performed and the managed process is the existence of documentation requirements. Assignment and reporting activities may already be documented at level 1, but the process itself should also be documented to reach level 2.

##### Level 3: Established

This means that the managed process has been implemented using a defined process capable of achieving the outcome of the process, and the process has already conducted by using formal standards and policies.

##### Level 4: Predictable Process

This means that the process has now been measured and monitored, and the outcomes can be predicted.

TABLE I. COMPARISON OF COBIT 4.1 AND COBIT 5

Criteria	COBIT 4.1	COBIT 5
Domain	No separation between the GCG domain and the management domain.	Distinguishes the GCG domain and the management domain. The governance domain incorporates COBIT 4.1, IT VAL, and IT Risk frameworks, and aligns other best practice frameworks such as ITIL V3 and TOGAF.
Assessment Model	Using Maturity Model which refers to Capability Maturity Model (CMM) consisting of:	Using Process Assessment Model referring to ISO / IEC 15504 "Information Technology Assessment."
	Level 5: Optimized	Level 5: Optimizing
	Level 4: Manage Measurable	Level 4: Predictable
	Level 3: Defined Process	Level 3: Established
	N/A	Level 2: Managed
	N/A	Level 1: Performed
	Level 0: Nonexistent. Level 1: Initial ad-hoc. Level 2: Repeatable but intuitive.	Level 0: Incomplete.
Scoring Method	The resulting value will tend to be higher because the domain process can reach level 3 without having to first meet the process at level 2.	The resulting value will be lower than COBIT 4.1 because the process has to reach a certain level, then the entire process must reach the requirement at the level before.

Source: Information System Audit and Control Association, 2013

#### Level 5: Optimizing Process

This implies that the predictable process is being continuously improved, and that it meets current business targets and relevant projections.

Each process is assessed using a standard rating scale defined in the ISO/IEC standard 15504. The rating scale can be seen in Figure 3.

Each rating scale is explained as follows:

“Not achieved” means that there is little or no evidence of attributes defined in the assessment process.

“Partially achieved” means that there is some evidence of an approach, but some aspects of attribute attainment may not be predictable.

“Largely achieved” means that there is evidence of a systematic approach and significant achievement of what the attributes defined in the assessment process. Some of the disadvantages associated with these attributes may exist in the assessment process.

“Fully achieved” means that there is evidence of a systematic and complete approach of the attributes defined in the assessment process.

*C. Previous Studies*

There were several studies related to IT governance assessment. The study from Castillo Felipe [7] evaluates the

IT governance maturity in AB Stockholms Lokaltrafik, a government-owned company that is responsible for the general transportation system in the municipality of Stockholm. The study assessed the IT organization from an IT governance perspective using the IT Organization Model Assessment Tool (ITOMAT). The purpose of such an assessment is to identify problem areas and suggest measures for improvement. The IT governance obtained the score 2.68 out of 5.0.

Another study from Credo Jilan [8] evaluates IT governance in Pertamina’s Central Hospital Indonesia using the COBIT 5 framework. It focused on the domain APO07 (Manage Human Resources), resulting in a capability level of 3 (Established Process). A recent study by Susanti Rahayu Yuni [9] evaluated the IT governance capability level in the Secretariat General of the Indonesian House of Representatives. The objective was to get the present capabilities level which are then followed by suggestions to enhance the capability level. Based on the result of this research, the IT governance capability was 1 (Performed Process). Recommendations for processes that need to be prioritized were APO13 (Manage Security), BAI01 (Manage Programs and Projects), and EDM01 (Ensure Governance Framework Setting and Maintenance).

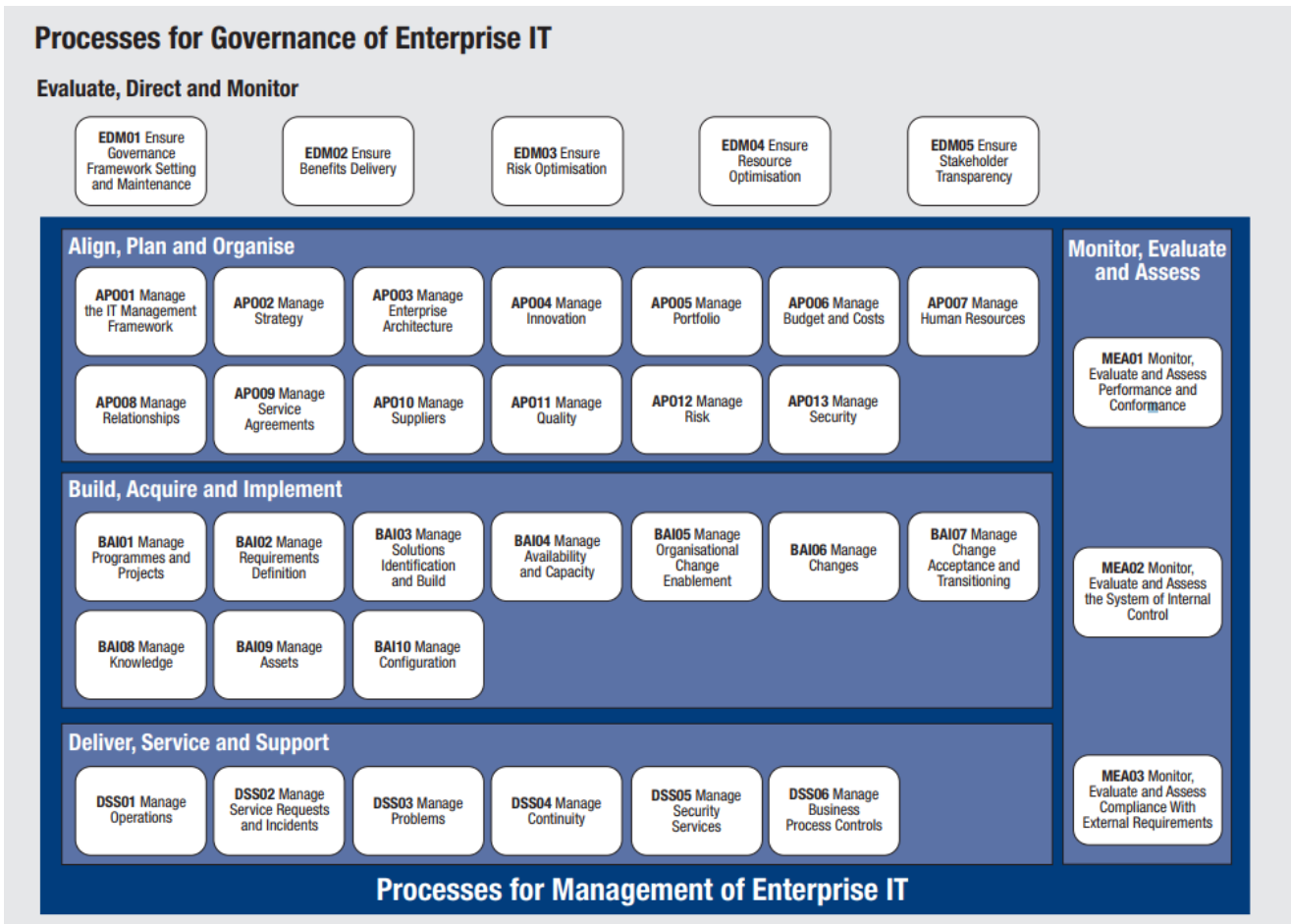


Fig. 1. COBIT 5’s 37 Processes

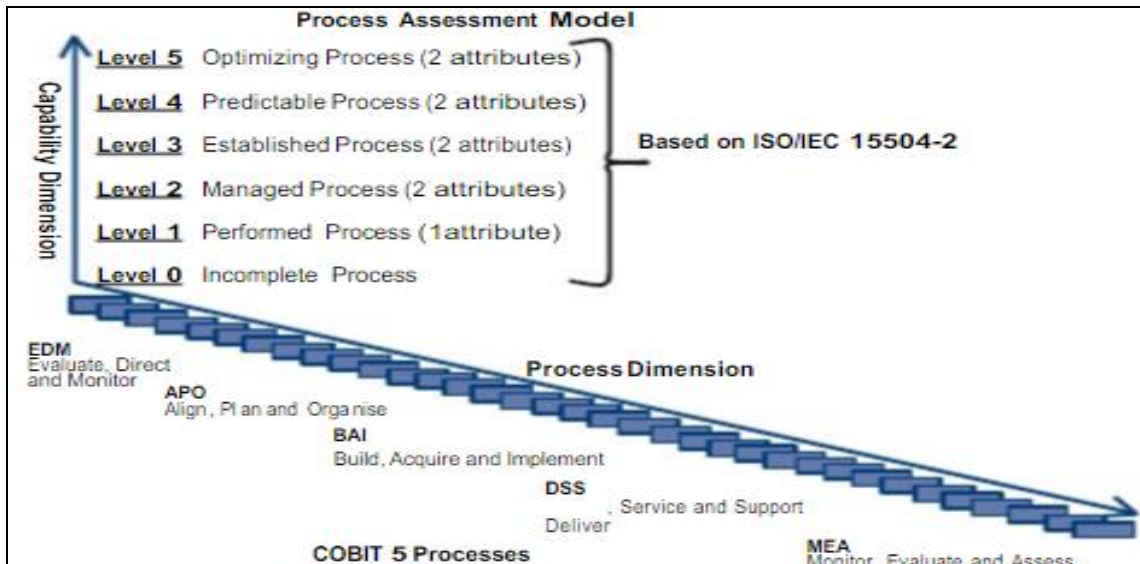


Fig. 2. Process Assessment Model (PAM)

Abbreviation	Description	% Achieved
N	Not achieved	0 to 15% achievement
P	Partially achieved	>15% to 50% achievement
L	Largely achieved	>50% to 85% achievement
F	Fully achieved	>85% to 100% achievement

Fig. 3. Rating Scale

### III. RESEARCH METHODS

This research was applied by conducting a case study of ABC Company. The method used was IT governance process capability analysis with qualitative data. This research uses a COBIT 5 Process Assessment Model to measure IT governance process capability. Problems were identified through a focus group discussion (FGD) with the IT Head Division, Application Development Staff, IT Support Staff, IT Engineers, and Internal Auditor.

#### A. Determination of Research Scope

The research scope is obtained by mapping the ABC Company goals into the COBIT 5 IT-related goals, COBIT 5 processes. The selected COBIT 5 processes are then mapped to ABC Company's current problem areas.

#### B. Process Capability Assessment

The assessment of the process capability level is divided into two parts, level 1 and levels 2 to 5. The assessment is conducted by filling out the questionnaire based on Self-Assessment Template COBIT 5 through a forum group discussion (FGD) with the internal auditor and Head of IT Division at ABC Company. As for capability level 1, each process has a different outcome, while for levels 2 up to 5, the assessment criteria are generic for each process.

#### C. Process Capability Review and Recommendation

The next step is to examine the details of the deficiencies or findings of any assessed process. The gap analysis will be done using a graphical tool to compare the current capability level result with the capability level target set by the Ministry

of SOEs. Based on the assessment, this research will provide suggestions, recommendations, and considerations that can be used to improve the process. The improvement plan focuses on areas that have gaps between current and target process capabilities.

### IV. RESULT AND ANALYSES

#### A. Results

The mapping process obtains 37 COBIT 5 processes to measure. These processes are then mapped into ABC Company's problems, which are defined in ABC Company IT Master Plan 2015–2017 document and Performance Report 2016. The IT Unit through FGD then reviews the problems. The mapping aims to create recommendations that can solve the recurring problems in ABC Company. From the summary of IT-related problems in ABC Company, there are seven issues related to IT project planning and implementation, IT investment and budget management, IT human resource availability and competency, IT risk management, issues and incidents, and related documentation and documentation/ procedure changes. The summary of problems at ABC Company can be seen as follows in Table II.

The 37 processes are then adjusted according to the relevant problems within ABC Company, resulting in the reduction from 37 to 16 processes. From the assessment of the current condition of the 16 processes of COBIT 5, there are nine processes still at capability level 1 and three at capability level 2, with only four processes having achieved capability level 3. The outcome is shown as follows.

After obtaining an IT governance assessment score, a gap analysis will be conducted to compare the results of the capability level and achievement rating with the short- and long-term targets to be achieved by ABC company. The targets are determined by the FGD with consideration of the availability of IT human resources at ABC Company. This gap analysis will be projected onto the radar chart. Representation of gap capability is shown in Table IV.

### B. Recommendation

The non-fully achieved (F) processes will be given recommendations for enhancement based on the COBIT 5 Enabling Process activity guide and best practices. Recommendations to achieve capability targets are as follows.

TABLE II. IT PAIN POINTS AT ABC COMPANY

No	Pain Points
1	IT Project implementation deviates from the master plan
2	IT Division does not know how to ensure the benefits of IT investment
3	IT Division does not have procedures to manage and assess budget identified with IT
4	IT Division does not have procedures to manage IT HR
5	IT Division does not have procedures to manage IT risks
6	IT Division does not have post-implementation IT documentation
7	IT Division does not have procedures to monitor the IT project

TABLE III. RESULTS OF CURRENT ABC CAPACITY ACHIEVEMENT

EDM	COBIT 5 Process	Capability Level	Achievement Rating	Information
	<b>Evaluate, Direct, and Monitor</b>			
EDM 02	Ensure Benefits Delivery	2	L	Performed
EDM 03	Ensure Risk Optimization	2	L	Managed
EDM 04	Ensure Resource Optimization	2	F	Managed
	<b>Align, Planning, Organization</b>			
APO 02	Manage Strategy	2	L	Managed
APO 05	Manage Portfolio	1	L	Performed
APO 06	Manage Budget and Costs	3	L	Established
APO 07	Manage Human Resources	2	F	Managed
APO 12	Manage Risk	3	L	Established
	<b>Build, Acquire, Implement</b>			
BAI 01	Manage Programs and Projects	2	L	Managed
BAI 04	Manage Availability and Capacity	3	L	Established
BAI 06	Manage Changes	3	L	Established
BAI 08	Manage Knowledge	1	L	Performed
	<b>Deliver, Service, and Support</b>			
DSS 02	Manage Service Requests and Incidents	2	L	Managed
DSS 03	Manage Problem	1	L	Performed
DSS 04	Manage Continuity	2	F	Managed
	<b>Monitor, Evaluate, Assess</b>			
MEA 01	Monitor, Evaluate and Assess Performance and Conformance	2	L	Managed
<b>Average Process Capability Level</b>		<b>2</b>		

TABLE IV. TARGET AND CAPABILITY GAP

COBIT 5 Processes		Current Condition		Short-Term Target		Long-Term Target	
		Level	Rating	Level	Rating	Level	Rating
	<b>Evaluate, Direct, and Monitor</b>						
EDM 02	Ensure Benefits Delivery	2	L	2	F	3	F
EDM 03	Ensure Risk Optimization	2	L	2	F	3	F
EDM 04	Ensure Resource Optimization	2	F	3	L/F	3	F
	<b>Align, Planning, Organization</b>						
APO 02	Manage Strategy	2	L	2	F	3	F
APO 05	Manage Portfolio	1	L	2	L/F	3	F
APO 06	Manage Budget and Costs	3	L	3	F	3	F
APO 07	Manage Human Resources	2	F	3	L/F	3	F
APO 12	Manage Risk	3	L	3	F	3	F
	<b>Build, Acquire, Implement</b>						
BAI 01	Manage Programs and Projects	2	L	2	F	3	F
BAI 04	Manage Availability and Capacity	3	L	3	F	3	F
BAI 06	Manage Changes	3	L	3	F	3	F
BAI 08	Manage Knowledge	1	L	1	F	3	F
	<b>Deliver, Service, and Support</b>						
DSS 02	Manage Service Requests and Incidents	2	L	2	F	3	F
DSS 03	Manage Problem	1	L	1	F	3	F
DSS 04	Manage Continuity	2	F	3	L/F	3	F
	<b>Monitor, Evaluate, Assess</b>						
MEA 01	Monitor, Evaluate, and Assess Performance and Conformance	2	L	2	F	3	F

TABLE V. RECOMMENDATION(S)

<b>COBIT 5 Processes</b>	<b>Recommendation(s)</b>
EDM 02	<ul style="list-style-type: none"> <li>a. Review whether the company has progressed towards identified objectives. Review whether the planned objectives have been achieved, performance targets have been met, and risks have been mitigated. This can be in the form of a strategic alignment evaluation report.</li> <li>b. Perform appropriate management actions as necessary to ensure that the value has been optimized, and make sure that management improvement actions are under control and carried out periodically.</li> </ul>
EDM 03	<ul style="list-style-type: none"> <li>a. Develop and set performance goals for the implementation of EDM 03 process and make sure it is documented. Management should know what the company wants to obtain from the execution process.</li> <li>b. Evaluate the EDM 03 process that has been executed and communicate the corrective actions to the related parties.</li> <li>c. Determine the duties, responsibilities, and authority of the EDM 03 processor to be communicated to the relevant parties.</li> <li>d. The work product of EDM 03 process, performance targets, and performance measurement metrics are defined and documented in the report.</li> <li>e. Evaluate and report the performance achievements of the risk optimization to the stakeholders.</li> </ul>
EDM 04	<ul style="list-style-type: none"> <li>a. Establishing methods, standards, or procedures to be used as guidance in conducting EDM 04 process. The procedure can refer to COBIT 5 practice base for EDM 04 process adjusted to company condition.</li> <li>b. The procedure defines who is responsible and has authorized access, including competence criteria and expertise to perform the EDM 04 process effectively.</li> <li>c. Evaluate the EDM04 process and document the evaluation results to provide improvements for the company's sustainability.</li> </ul>
APO 02	<p>The company is recommended to shift the function of IT from operational to a strategic function. The IT Committee and the Board of Directors must work together to develop strategies to reduce the cost of standard operating services and allocate resources to services. To utilize information technology strategically, the BoDs should be willing to take an introspective view of spending decisions and allocation of IT resources.</p>
APO 05	<ul style="list-style-type: none"> <li>1. Monitoring, optimizing, and reporting investment portfolio performance by doing the following actions: <ul style="list-style-type: none"> <li>a. Regularly review the IT portfolio and ensure that it aligns with the business strategy. Maintain the investment targets by doing re-evaluations and portfolio reprioritization so that its overall value can be optimized.</li> <li>b. Develop metrics to measure IT contribution to the company. Set performance targets that reflect the IT and enterprise capabilities. Companies can seek direction from external experts.</li> </ul> </li> <li>2. Managing achievement of benefits by doing the following actions: <ul style="list-style-type: none"> <li>a. Use agreed upon metrics to track profitability, evolution throughout the program and project life cycle, delivery of IT services, and comparisons with internal or industry benchmarks.</li> <li>b. Carry out corrective action(s) when the achieved benefits significantly deviate from the expected benefits.</li> </ul> </li> </ul>
APO 06	<ul style="list-style-type: none"> <li>a. Monitor the budget execution and IT cost.</li> <li>b. Communicate the budget that has been set and review it by involving the related business unit.</li> <li>c. Coordinate and communicate with each subsidiary in budgeting.</li> </ul>
APO 07	<ul style="list-style-type: none"> <li>a. Establish methods, standards, or procedures to be used as guidance in conducting IT human resource management process. Procedures can refer to the COBIT 5 practice base for APO07 process adjusted to company conditions.</li> <li>b. Immediately complete the competency map for the entire IT unit.</li> <li>c. Minimize dependency on one individual who performs critical job functions by documenting, succession planning, cross-training initiatives, knowledge sharing, providing staff backup, and carrying out work rotation initiatives.</li> </ul>
APO 12	<ul style="list-style-type: none"> <li>a. Develop procedures to mitigate risks by improving the quality of BCP &amp; DRC and conducting BCP &amp; DRC trials on a group basis.</li> <li>b. Allocate appropriate resources and provide IT human resources training to improve competencies related to IT risks.</li> </ul>
BAI 01	<ul style="list-style-type: none"> <li>1. Develop and plan IT programs or projects by performing the following actions: <ul style="list-style-type: none"> <li>a. Ensure that the accountability of each project is clear and unambiguous; this is included in the calculation of project benefits and costs.</li> <li>b. Ensure the project-planning document has provided sufficient information for the project progress to be controlled. The plan should include the criteria the project will generate and criteria for how the project can be accepted by the company.</li> <li>c. Ensure that project planning documents include required resource estimates, internal and external stakeholder responsibilities, clear job breakdown structures, manufacturing phases (blueprint through implementation), dependency estimates, and critical path identification.</li> <li>d. Ensure effective communication of project plans and progress reports among all projects with the overall IT program.</li> </ul> </li> <li>2. Companies are advised to manage project resources effectively in the following manner: <ul style="list-style-type: none"> <li>a. Ensure business and IT resource needs for identified projects have appropriate roles and responsibilities.</li> <li>b. Ensure that each project has an experienced Project Manager who can lead the team according to project complexity and risk.</li> <li>c. Ensure the roles and responsibilities of other relevant parties such as the financial, legal, procurement, human resources, internal audit, and quality assurance sections are clearly defined.</li> </ul> </li> </ul>
BAI 04	<ul style="list-style-type: none"> <li>a. Establish a method to manage the availability and capacity of IT services and to monitor, measure, analyze, report, and review availability, performance, and capacity.</li> <li>b. Integrate the monitoring and reporting activities into recurrent capacity management activities (monitoring, analysis, tuning, and implementation).</li> </ul>
BAI 06	<ul style="list-style-type: none"> <li>a. Determine the need for IT human resources competencies and skills to run the change management process. Provide and allocate IT human resources to run the BAI 06 process.</li> <li>c. Categorize all request changes.</li> <li>d. Business and IT units use formal change requests and ensure that all changes are made to the change request management process.</li> </ul>
BAI 08	<ul style="list-style-type: none"> <li>a. Proactively communicate the value of knowledge and knowledge sharing.</li> <li>b. Create a knowledge-sharing program at least twice a year.</li> </ul>
DSS 02	<ul style="list-style-type: none"> <li>a. Prioritize service and incident requests.</li> <li>b. Monitor the incident resolution timing and execute handling procedures for completion.</li> <li>c. Analyze incidents and service requests and identify recurring problem patterns and inefficiencies.</li> </ul>

TABLE V. RECOMMENDATION(S) (CONTINUE)

COBIT 5 Processes	Recommendation(s)
DSS 03	a. Investigate and diagnose root causes by using relevant experts. b. Raise the known errors after the root cause of the problem is identified, make a known error note, and identify the appropriate and potential solutions. c. Conduct proactive problem management by collecting and analyzing operational data (especially incident records and changes) to identify emerging trends that may indicate a problem. d. Ensure that business process owners and configuration managers meet regularly to discuss known issues and plan changes for the future. e. Optimize the use of resources for problem-solving, initiate sustainable solutions, and increase demand for change through established change management processes.
DSS 04	a. Establish methods, standards, or procedures to be used as guidance to DSS 04 process. The procedure can refer to COBIT 5 practice base for DSS 04 process adjusted to company condition. b. Define who is responsible and has the authority, including competence and expertise criteria, to effectively manage availability and capacity. c. Evaluate the DSS 04 process and document the evaluation results to provide improvements for the company's sustainability.
MEA 01	a. Collecting and processing performance data such as investment portfolio performance reports, service performance reports, supplier compliance results, program performance review results, availability and performance reports, facilities assessment reports, incident status and trend reports in a timely and accurate manner. b. Process data using appropriate tools, systems for processing, and data formats for analysis. c. Designing a compact, easy-to-understand performance report process tailored to a variety of management and audience needs. Facilitate effective and timely decision-making and ensure that goals and metrics are communicated in a readily understandable way.

### CONCLUSION

Based on the results and analysis of the 16 selected processes, the average capability of IT governance of ABC Company is at level 2 (managed) with the majority in the Largely Achieved (L) rating, meaning that the IT governance processes have been mostly fully performed and managed, but several processes have not yet been established. Only a few processes already have process standards and procedures; most still do not have documented standards and procedures.

This study has limitations in terms of selection of research scope, as there are only 16 processes from COBIT 5's 37 processes. It is suggested that subsequent research should assess all 37 of COBIT 5's processes using evidence-based assessments with COBIT 5's Process Assessment Model, which is widely used by professionals.

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