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Measurement of IT Governance Capabilities Using COBIT 2019 in the Indonesian Business Sector

Ricardo Cuatanto[1], Rudi Sutomo[2*]
ricardo.cuatanto@student.umn.ac.id, rudi.sutomo@umn.ac.id
[1, 2] Faculty of Informatics and Engineering, Information System Department, Universitas Multimedia Nusantara, Indonesia

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Abstract

The Indonesian business sector uses information technology to support private, business, and governmental decision-making. However, there are problems with IT implementation, such as a weak Business Continuity Plan, a lack of change testing procedures, and insufficient project review activities. Utilising the COBIT performance model based on COBIT 2019, this study seeks to evaluate the IT governance of the Indonesian business sector. The chosen domains are BAI05 (Managed Organizational Change), BAI06 (Managed IT Changes), and BAI07 (Managed IT Change Acceptance and Transitioning). According to the results, BAI05 scored level 2 (90.6%), BAI06 scored level 2 (80.3%), and BAI07 scored level 2 (87%) respectively. Level 3 (78%) is where BAI07 falls short and needs to be improved. Following a set timeline, recommendations will be implemented once they have been approved by SM Innovation & Digital Transformation and Manager Innovation & IT Project Management in the Indonesian Business Sector.

A. Introduction

Information technology is used to process, retrieve, change, organise, and store information in various ways to provide better data. When making decisions for personal, professional, or governmental reasons, people benefit from having access to good information that is timely, reliable, and relevant [1][2].

All public and private businesses must now keep up with IT to improve the efficiency and effectiveness of their work processes. However, applying IT can also increase the company's stable business productivity, allowing it to grow and compete in the market[3][4]. Companies understand the use of information technology that can generate added value for the company. This can improve the efficiency and effectiveness of the company's performance [5][6].

IT governance is one of the uses of information technology in a business or organisation. IT Governance is a planning method in the introduction and use of information technology used by organisations and SOEs to match the organisation's vision, mission and goals. In addition, IT Governance also aims to clarify decisions made and ensure IT implementation is aligned with organisational strategy [7][8].

Indonesian Business Sector is one of the state-owned companies that uses information technology in its work process. Indonesian Business Sector itself is an MRO sector company located in Indonesia. Indonesian Business Sector is the largest aircraft handling company in the region that provides integrated solutions to global customers. The Indonesian Business Sector is expanding its business by entering the industrial gas turbine engine market. Indonesian Business Sector is a State-Owned Enterprise (SOE) company, so it is subject to the Ministerial Regulation regarding the Preparation of Information Technology Management of State-Owned Enterprises[9][10].

Based on the conversation in the pre-interview with the Indonesian Business Sector, represented by Mr. Rohman Endryatno Wibowo as Manager of ERP System Solution, several problems arise that become factors in the emergence of several IT change problems that can affect the company. Therefore, the IT service changes made in the Indonesian Business Sector must be evaluated. One way for organisations to align IT implementation with business goals is to conduct an IT assessment. The Control Objective for Information and Related Technology (COBIT) is one framework that can be utilised in such testing. COBIT 2019 focuses on information and technology management and maximising value to help companies optimise risk, generate profits, and optimise resources [11]. One of the main factors behind the creation of COBIT 2019 is the management of IT in companies that must be faster, more agile, and more conducive to innovation [12]. In the evaluation of IT management to be carried out, the focus area lies in managing IT changes as a business problem. In this case, the Indonesian Business Sector can use the COBIT Framework as a reference framework for measuring the management of the company's IT system.

B. Research Method

Information Systems Audit and Control Association requirements and standards are followed while measuring and utilising the COBIT 2019 framework. The measurement produced an analysis of the company's competence level and

gaps. Both quantitative (questionnaire) and qualitative (literature review and interviews) approaches were used for data collecting[13][14].

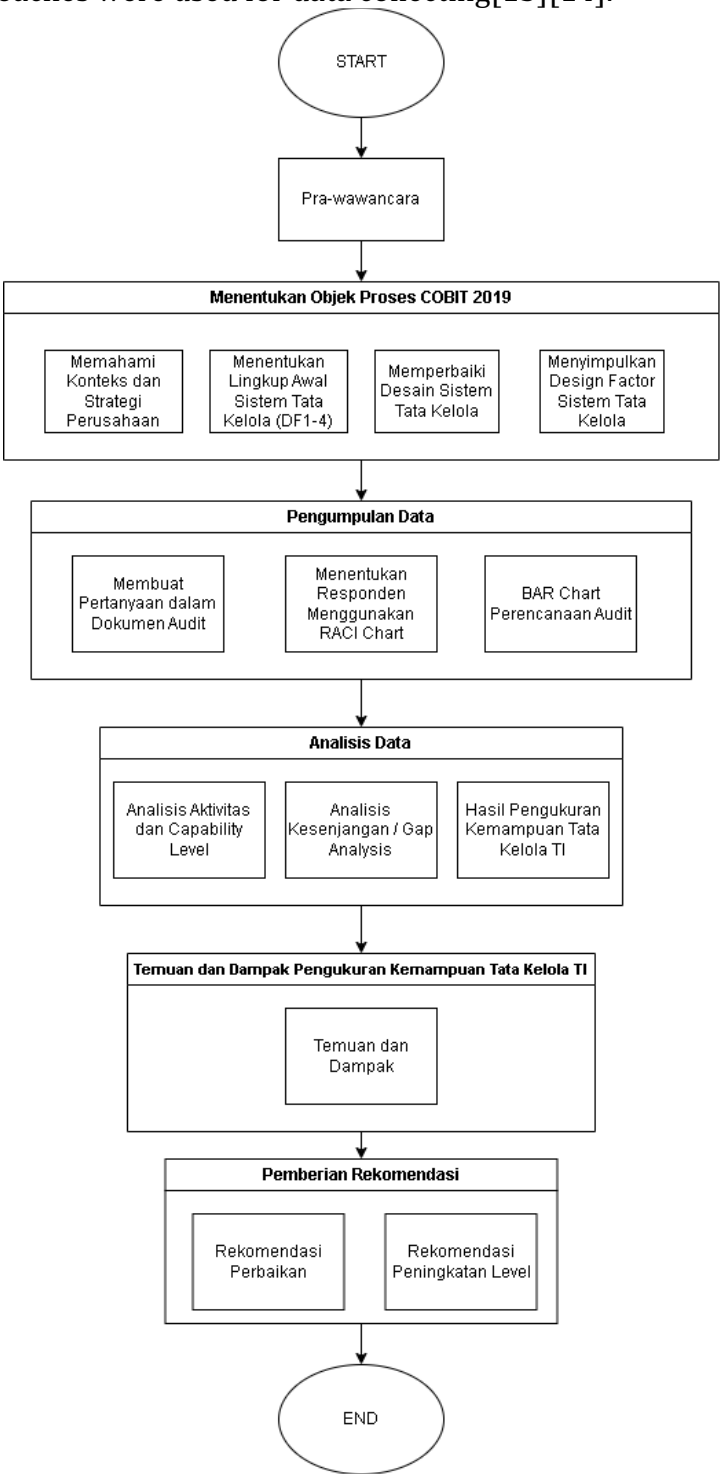

Figure 1. Research Framework

Figure 1 shows the flow of the research framework. The pre-interview was conducted with the company by analysing the company's problems and the effect that impacted the company. Based on the results of discussions in pre-interviews with the Indonesian Business Sector, represented by Mr. Rohman Endryatno Wibowo as Manager of ERP System Solution, several problems emerged that

became factors in the emergence of several IT change problems that could affect the company.

This stage focuses on understanding the company's background, strategy, and issues. The conversation then moves on to the design process based on COBIT 2019 Design Factors. Companies can develop governance systems by considering design aspects. After completing the design process, the necessary COBIT 2019 domains will be determined to assess the organisation's level of IT Changes. The next step involves selecting respondents for questionnaires based on the identified domains for the research. Respondents will be chosen according to the distribution of activities outlined in the 2019 COBIT book and the RACI Chart. The RACI Chart will help determine each party's engagement level in specific activities efficiently[15].

Questionnaire data is collected, and the capacity level of the responses is assessed in the data analysis stage. The level of capacity attainment in the COBIT 2019 framework is evaluated using a rating scale. This assessment helps determine if there is a gap within the organisation. To evaluate the performance gap of internal management, a method called gap analysis is used[16]. In the final phase of company research, the Findings and Recommendations stage, the focus is on understanding the existing results and their impact on the business. These results are based on the earlier stages of the research. Once the results and their significance are determined, the next step involves formulating research conclusions and providing recommendations to the organisation [17].

C. Result and Discussion

The data analysis findings (not the raw data) are contained in the results and discussion section. Tables and graphs can help in presentation, but they must be accompanied by an explanation or justification of the study's findings. The discussion continues by comparing the study findings to prior findings, theories, or accepted knowledge supported by references. Research findings may be in agreement, disagreement, or even contradiction.

Pre-Interview Stage

Specific issues arose in the IT Changes area following the conduct of the pre-interview stage with the Indonesian Business Sector. The business must assess its current information technology management using COBIT 2019 as a framework due to issues inside the organisation. Managing IT changes as a business challenge will be the focus of the following examination of IT management.

Understanding the Context and Strategy within the Company

The pre-interview findings provide background information on the issues the organisation is currently experiencing. It was discovered that the Indonesian Business Sector's business environment involves MRO, which prioritises service. Indonesian Business Sector enhances its services to the corporate IT implementation to better its company operations. The IT Master Plan in the Indonesian Business Sector has had the improvement plan in place for a while.

Determining the Scope of the Governance System

This stage focuses on design factors 1 to 4 to establish the company's scope. Design Factor 1 highlights Growth/Acquisition as the Indonesian Business Sector's primary objective, with a 5 out of 10 significance rating. The Indonesian Business Sector emphasises business expansion and earnings. Design Factor 2, Enterprise Goals, encompasses five key goals: competitive product portfolio, compliance, customer-oriented service culture, internal process optimisation, and innovation. Design Factor 3, Risk Profile, IT Cost, and Oversight, poses the highest risk, particularly IT operational infrastructure incidents. The 2019 COBIT design toolkit identifies 15 major IT-related concerns under Design Factor 4, indicating significant challenges for the Indonesian Business Sector.

Refining the Scope of the Governance System

This stage refines the governance system (design factors 5-11). Key findings: The Indonesian Business Sector's Threat Landscape is primarily standard (80%), with 20% at high levels, requiring a different focus on information security. Design Factor 6 indicates a preference for high-level regulation (78% compliance rate). Indonesian Business Sector falls under the strategic category for IT's role (Design Factor 7), emphasising its importance in operations. The company uses an insourced sourcing methodology (Design Factor 8) and applies DevOps for IT implementation (Design Factor 9). Indonesian Business Sector follows established technologies (Design Factor 10) and is classified as a large enterprise with over 5000 employees (Design Factor 11).

Summarising the Governance System Design

Considering the Indonesian Business Sector's strategic goals, such as executing Digital Operation Enhancement and advancing significant digitisation in the upcoming year, these three sub-domains are further justified. This emphasises the company's need for effective IT Changes to ensure long-term success.

Figure 2. List of Sub-Domain in the Indonesian Business Sector

Figure 2 shows the 24 available sub-domains, of which three were picked for assessment in the Indonesian Business Sector. These three sub-domains, BAI05 -

Managed Organizational Change, BAI06 - Managed IT Changes, and BAI07 - Managed IT Change Acceptance and Transitioning, were chosen due to their applicability to the subject of IT Changes. Additionally, these sub-domains have anticipated competence levels ranging from level 2 to level 3.

Data Collection

To continue the measurement process using the BAI05 - Managed Organizational Change, BAI06 - Managed IT Changes, and BAI07 - Managed IT Change Acceptance and Transitioning sub-domains, a questionnaire was filled out to determine the objective value to be assessed as part of the data collection process from the Indonesian Business Sector. The questionnaire was distributed using the Google Form platform, and respondents then received it.

Determining Audit Respondents Using the RACI Chart

The following Table. 1,2,3 is the RACI Chart of Indonesian Business Sector respondents on process objectives APO12, APO13, and DSS05 based on COBIT 2019:

Table 1. RACI Chart BAI05 – Managed Organizational Change

Activities	SM Information & Digital Transformation	Manager Innovation& IT Project Management	Vice President
BAI05.01 Establish the desire to change	R/A	R/A	C/I
BAI05.02 Form an effective implementation team.	R/A	R/A	C/I
BAI05.03 Communicate desired vision.	R/A	R/A	C/I
BAI05.04 Empower role players and identify short-term wins.	R/A	R/A	C/I
BAI05.05 Enable operation and use.	R/A	R/A	C/I
BAI05.06 Embed new approaches.	R/A	R/A	C/I
BAI05.07 Sustain Changes.	R/A	R/A	C/I

It will be adjusted to determine who will be interviewed, referring to the RACI Chart by the organisational structure components recommended by COBIT 2019. Suitable respondent parameters are people with job functions responsible for the organisation's management process and IT governance, as well as the transparent division of roles according to their capacity and responsibilities in the Indonesian Business Sector. Based on the BAI05 – Managed Organizational Change process shown in Table 1 above.

Table 2. RACI Chart BAI06- Managed IT Changes

Activities	SM Information & Digital Transformation	Manager Innovation & IT Project Management	Vice President

BAI06.01 Evaluate, prioritise and authorise change requests.	R/A	R/A	C/I
BAI06.02 Manage emergency changes.	R/A	R/A	C/I
BAI06.03 Track and report change status.	R/A	R/A	C/I
BAI06.04 Close and document the changes.	R/A	R	C/I

The following RACI Chart contains the division of roles according to precise tasks along with roles and responsibilities within the Indonesian Business Sector based on the process in BAI06 - Managed IT Changes in Table 2 above.

Table 3. RACI Chart BAI07 – Managed IT Change Acceptance and Transitioning

Activities	SM Information& Digital Transformation	Manager Innovation & IT Project Management	Vice President
BAI07.01 Establish an implementation plan.	R/A	R	C/I
BAI07.02 Plan business process, system and data conversion.	R/A	R	C/I
BAI07.03 Plan acceptance tests	R/A	R	C/I
BAI07.04 Establish a test environment	R/A	R	C/I
BAI07.05 Perform acceptance tests	R/A	R	C/I
BAI07.06 Promote production and manage releases.	R/A	R	C/I
BAI07.07 Provide early production support.	R/A	R	C/I
BAI07.08 Perform a post-implementation review.	R/A	R	C/I

The following RACI Chart contains the division of roles according to precise tasks and roles and responsibilities within the Indonesian Business Sector based on the BAI07 – Managed IT Change Acceptance and Transitioning process in Table 3 above.

It will be possible to choose who will be interviewed using the RACI Chart that has been developed. It will be decided which individuals—the Senior Manager and Manager of the RACI chart—will be interviewed for the domains BAI05 - Managed Organizational Change, BAI06 - Managed IT Changes, and BAI07 - Managed IT Change Acceptance and Transitioning. The VP will be contacted for the Consulted and Informed responsibilities. Directly using Google Forms, the interview step was conducted. COBIT 2019 will be used to assess the information gathered from interview responses.

Activity Analysis and Capability Level

Based on the questionnaire answers from the SM Information & Digital Transformation and Manager of Innovation & IT Project Management at

Indonesian Business Sector, the following calculations have been made, with the findings shown in Table 4.

Table 4. Assessment Result

Result	Average	Expected	Actual
BAI05 – Managed Organizational Change	90,6%	2	2
BAI06 – Managed IT Changes	80,3%	2	2
BAI07 – Managed IT Change Acceptance and Transitioning	87%	3	2

After calculating each process and domain in the Indonesian Business Sector, the next step is to compare the results obtained during the interview with the level desired by the Indonesian Business Sector. The target level desired by the Indonesian Business Sector in the BAI05 process is level 2; for BAI06, it is level 2, and for BAI07, it is level 3.

Table 5. Assessment Result Level 3

Result	Average	Expected	Actual
BAI07 – Managed IT Change Acceptance and Transitioning	78%	3	2

The process will be documented by summarising questions from COBIT 2019. The average capability levels for the selected processes are as follows: BAI05 at 90.6%, BAI06 at 80.3%, BAI07 at 87%, BAI07 at 87% for level 2, and BAI07 at 78% for level 3. After obtaining these measurements, a gap analysis will be conducted. Interviews with company sources, including the business, IT, and CEO, were conducted to determine the company's current condition. The CEO's interviews also provided insights into the expected conditions, with expectations set at level 2 for BAI05 and BAI06 processes. However, a gap exists in meeting the company's requirements for the BAI07 process.

GAP Analysis

The next stage is to compare the design toolkit's goal level (anticipated level) with the measurement data after all sub-domains have been determined. Comparing the goal to the expected level may be described more simply using gap analysis—computation results (level actual). Table 6 lists the outcomes of the gap analyst computation.

Table 6. GAP Analysis Result

Objective	Expected Level	Actual Level	Gap
BAI05 – Managed Organizational Change	2	2	0
BAI06 – Managed IT Change	2	2	0
BAI07 – Managed IT Change Acceptance and Transitioning	3	2	1

Among the three additional sub-domains, level 3 competency was BAI07 – Managed IT Change Acceptance and Transitioning anticipated. This demonstrates that if the capacity at level 2 has been fulfilled, the BAI07 – Managed IT Change Acceptance and Transitioning sub-domain needs additional measurement to level 3. However, the Indonesian Business Sector only has level 2 capacity since the level 2 measurement findings are insufficient to forward the study. Therefore, suggestions for improvement are required for the Indonesian Business Sector to achieve a higher level of competency in the BAI07 – Managed IT Change Acceptance and Transitioning sub-domain.

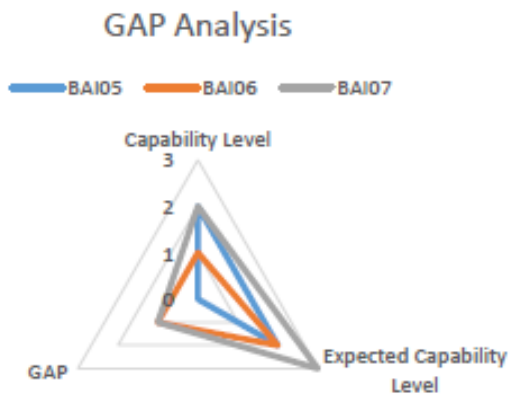

Figure 3. Radar Chart Comparison of target level and current level

Based on Table 6 and Figure 3, which are the results of the assessment that has been carried out, you can see a comparison of the target level determined by the Indonesian Business Sector with the current level obtained by the Indonesian Business Sector. The following explains all the levels obtained by the Indonesian Business Sector with the target levels determined by the Indonesian Business Sector.

1) The measurement results in the BAI05 – Managed Organizational Change process reached the target set by the Indonesian Business Sector, namely at level 2, with a value of 90.6%.
2) The measurement results in the BAI06 – Managed IT Changes process achieved the target set by PT. Then, recommendations for improvements to the BAI06 process will be provided.
3) The measurement results in the BAI07 process - Managed IT Change Acceptance and Transitioning have not yet reached the specified target because, in this process, the company has only reached level 2 in the BAI07 process. In contrast, the target was determined at level 3. In the level 3 assessment, the company only achieved the value of 78%, which can be said to have not met targets/achievements. To help companies, recommendations for improvement will be provided in Table 7 and level increases, which will also be in the form of recommendations in Table 8.

Findings and Recommendations from IT Governance Capability Measurement Results

After assessing the capability level in the Indonesian Business Sector with the chosen sub-domains, there are results and implications from the assessed activities. Results are drawn from activities whose values do not match the scale's average fulfilment. Table 7 displays the findings list.

Table 7. Findings

Objective	Findings

BAI06 – Managed IT Changes	1) There is no procedure to authorise program changes for emergencies. 2) The Business Continuity Plan for the Indonesian Business Sector has not covered the IT area as a whole. All changes made are based on desire, not documented procedures.
BAI07 – Managed IT Change Acceptance and Transitioning	1) The implementation of Business Continuity Planning in the Indonesian Business Sector has not been maximised. 2) There is no change in the testing plan yet. 3) The Indonesian Business Sector does not implement automated scripted tests. 4) There is no activity to review projects that have been implemented.

The findings of impacts from BAI06 Managed IT Changes are displayed in Table 7. This occurs as a result of the four actions all focusing on the same aspects of IT Changes. The second result and impact, which is more in favour of documentation, comes from BAI07 - Managed IT Change Acceptance and Transitioning.

Some recommendations may be made to the firm after collecting the results and the effect of the findings as a consequence of the findings. Table 8 contains a set of recommendations for the sub-domains for improvement.

Table 8. Improvement Recommendations

Objective	Activity	PIC
BAI06 – Managed IT Changes	1) Create procedures that authorise program changes for emergency conditions. 2) Implement a comprehensive Business Continuity Plan in the IT department so that changes made are by company needs through the existing documentation process.	SM Innovation & Digital Transformation VP Corporate Strategy
BAI07 – Managed IT Change Acceptance and Transitioning	1) Maximize the performance of the Business Continuity Plan so as not to disrupt operational activities. 2) Create a test plan before implementing changes to minimise the company's vulnerability to failure, system instability, and project delay. 3) Including automated scripted tests when testing to cut down testing time wastage. 4) Conduct a review of the projects implemented to find out the benefits and feedback from users to know the effectiveness of the direction of IT development.	VP Corporate Strategy Manager Digital Solution SM Innovation & Digital Solution SM Innovation & Digital Solution

Based on design factor results, the Indonesian Business Sector requires improvement recommendations to reach the desired capability level. Specifically, improvement suggestions are needed to address the level gap in their IT governance procedure, particularly in the BAI07 - IT Change Acceptance and Transitioning sub-domain. Table 9 offers level improvement suggestions for the BAI07 sub-domain.

Table 9. Improvement Recommendations

SubProcess	Activity	PIC
BAI07.02	1) Consider conversion-related risks, business continuity planning, and recovery measures. Apply traffic filtering on endpoint devices. 2) Ensure that the test plan carries out testing of changes.	IT Governance

BAI07.04	3) Ensure the test environment reflects the future business and operational environment. And Include business process procedures and roles.	Manager Digital Solution
BAI07.05	4) Ensure that there are tests on the changes made by the test plan 5) Figuring out how to balance interactive user and automated script testing. 6) Conduct security testing according to the test plan and identify security weaknesses or breaches. 7) Test the application system according to the test plan. 8) Identify, record and classify errors.	Manager Digital Solution
BAI07.08	9) Evaluate post-implementation events.	IT Project Management

The suggestions made refer to the 2019 ISACA COBIT book. Based on the results, the Indonesian Business Sector needs to focus on improving its business continuity plan, creating test plans (including automated scripted tests), reviewing implemented projects, and establishing procedures for authorising program changes during emergency conditions.

D. Conclusion

The following conclusions are based on research on using COBIT 2019 to gauge an organisation's level of IT governance proficiency. These procedures, Managed Organizational Change (BAI05), Managed IT Changes (BAI06) and Managed IT Change Acceptance and Transitioning (BAI07), were selected in response to the company's existing problems. Except for the BAI07 process, which the company expects to be at level 3, the outcomes of evaluating the capacity level from these processes are currently in line with the level 2 target the company set as its expectations. The COBIT 2019 process capability level this company chose is measured at the BAI07 process, producing a gap value of 1 level even though it expects its level of competence to be at level 3. After assessing each procedure's proficiency, the problems' root causes are found. Following identifying the underlying causes of these issues, suggestions for improvement are made to ensure they don't recur inside the business. Depending on how well each activity is carried out relative to the expected target level, the same is true for recommendations for enhancing the company's use of modern information technology. The company has taken note of and acted upon suggestions for improvement. The procedure with the lowest values among those picked by the organisation should be implemented first: BAI07 - Managed IT Change and Transitioning. The procedures will be mostly complete by December 2023.

E. Acknowledgment

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