



Capability Level Measurement of Information Systems Using COBIT 5 Framework in Garment Company

Deva Putra¹, Melissa Indah Fianty^{2,*}

^{1,2}Information Systems, Universitas Multimedia Nusantara, Tangerang, Banten, Indonesia
Email: ¹deva.putra@student.umn.ac.id, ²melissa.indah@umn.ac.id

Abstract

The industrial company specializing in garment products uses information technology called ERP System to support daily activities. The information technology used is close to unavoidable problems. The problems in this company are internet and VPN connections being interrupted/disconnected, computer hardware damage, and user understanding of applicable information technology SOPs. To solve these problems, COBIT 5 was chosen to overcome existing problems by evaluating existing IT governance to produce and measure the level of capability and solution to problems. This research uses three processes, namely APO01, APO12, DSS03, which are obtained from the results of mapping the vision, mission, and problems faced by the company. Data were collected by interviewing resource persons: IT Managers, Accounting and Tax Managers, and the staff concerned. Moreover, they conducted a literature study on COBIT 5 to obtain the value of gap results and capability levels as recommendation guidelines. The result obtained is that the capability level is at level 1. The level gap is 1 level, comparing current conditions with the company's expected conditions. Ten recommendations are given to the company from the results of discussions to improve and develop information technology governance.

Keywords: COBIT 5, GAP Analysis, Capability Level, IT Governance

1. INTRODUCTION

Information Technology (IT) is developing rapidly, to the point of propagating in every area of everyday human life [1]. With this rapid development, information technology dramatically influences the company's business processes [2]. Information technology also affects the automation of information access and speed. Accuracy, as well as providing data within the company [3]. To achieve this, IT management is needed so that IT can be utilized to support the success of an organization in achieving its goals. In addition, the success of organizational governance depends on how far an information technology governance has been implemented [4].



IT governance is a set of processes and procedures that aim to ascertain the extent to which IT has been implemented [4]. There are five focus areas in information technology governance: Strategic Alignment, IT Value Deliver, Resource Management y, Risk Management, and Performance Management[5]. The focus area in information technology governance can control the use of information technology resources in terms of humans and the availability of information technology devices [6]. Thus, an evaluation of IT governance is needed to determine and measure the information technology implemented to help organizations meet their objectives [7].

Evaluation is a process carried out to determine and measure a program or IT planned to support the achievement of a goal [7]. This IT governance evaluation is also helpful for measuring capability and recommending solutions and improvements. IT governance evaluation has a variety of standards that can be used as research tools. Some of the existing standards are the Information Technology Infrastructure Library (ITIL) and Control Objectives for Information and Related Technologies 5 (COBIT 5) [4]. ITIL is an evaluation that focuses on the services provided to customers and does not focus on the process of aligning IT strategies with the company. At the same time, COBIT 5 has a framework that aims to know and manage overall IT governance and pay attention to aspects of IT governance. Thus, COBIT 5 was chosen as a framework that was considered appropriate to assist the IT governance evaluation process in assisting a company in evaluating the extent to which the implementation of IT within the company can support the fulfillment of the company's vision and mission that has been implemented [4].

COBIT 5 has five domain scopes, namely Domain APO (Align, Plan, Organize), Domain BAI (Build, Acquire, and Implement), Domain DSS (Deliver, Service, and Support), Domain EDM (Evaluate, Direction, and Monitoring), and Domain MEA (Monitoring, Evaluate, and Asses) [8]. The domain of COBIT 5 provides several measures, indicators, and processes to improve the performance of an organization in managing information technology governance [8]. In its use, COBIT 5 can measure the level of achievement of a process and activity that has been implemented and assess the capability level of the selected domain and process [9]. Thus, the use of COBIT can be used by a company or organization as a framework to assist in the management of information technology governance that has been implemented in a company in a comprehensive and integrated manner [7]. The garment company is the object of this study to evaluate information technology governance.

The companies engaged in Indonesia's most significant garment industry. In carrying out its corporate processes, supported by the IT department of the Hardware and Support, Network, and Infrastructure division, which is directly

under the IT Manager of the company, and an information technology system that runs called ERP system. In the IT division, there are still some things that need fixing. The focus area of this study is resource management, which is directly related to the condition of information technology resources. Based on information from the speakers, problems exist, such as inconsistency in SOP compliance between existing human resources (HR) in understanding information technology SOPs that apply. In addition, it also has internet connection problems, and the VPN is interrupted/disconnected by using its centralized database. This company also has problems, namely damage to computer hardware in the form of mice, keyboards, power supplies, monitors, and WIFI adapters. Based on these problems, several impacts have arisen. Here is Table 1, which explains the problem, its impact, and focus areas [10].

Table 1. Problems, Impacts and Focus Areas

No.	Problem	Impact	Focus Areas	Frequency
1	Internet connection and VPN interrupted / disconnected.	Obstruction of the wheels of the organization, and the process of continuity of enterprise productivity	Quality of Information Technology Resources / Resource Management	Happens Quite Often
2	Computer hardware damage in the form of a mouse, keyboard, power supply, monitor, wi-fi adapter.		Quality of Information Technology Resources / Resource Management	Frequent
3	User's understanding of applicable information technology SOPs		Quality of Human Resources / Resource Management	Happens Quite Often

Table 2. Problem Frequency Rate

Problem Frequency Rate	
Information	Meaning
Very Rare	The Problem Occurs Once in >5 Years.
Rarely Happens	The problem occurs once between 1 – 5 years
Quite Often Occurs	The Problem occurs 1-6 times a year.
Frequent	Problems occur an average of 1 time every month
Very Often Occurs	The problem occurs at least 1 time a week

Based on Table 2, the focus area chosen follows the existing problem: resource management. Resource management focuses on managing the company for its

resources. One part of resource management is in providing risk management services. The problem in the first point concerned with internet connection and VPN has an impact on hampering productivity and business communication, which currently uses more Internet connections, be it in terms of online meetings with outside parties, correspondence communication with email, and access to company information systems that use internet and VPN lines that are outside the company's location or in the cloud. Based on information from the source, events can occur at any time, unpredictable, unless it has been planned for maintenance. The second point, regarding hardware damage, has an impact on hampering the productivity of the staff concerned with the tasks assigned within a certain period, although not for a long time, due to the replacement of damaged devices using existing stock or with repairs to these devices. The third point regarding user understanding of IT SOPs such as changing login passwords that must be done every month, Restrictions on the use of internet connections with network cables and wireless for staff, Changes in connection lines on computer networks that must go through the IT Department at the time of relocation or change of work location.

Based on the problems that occur and the resulting impact, it will be an obstacle to achieving its vision and mission. The implementation of IT that has been carried out is still not running optimally, where an IT governance evaluation is needed using COBIT 5 as an evaluation guideline to overcome existing problems by measuring information technology governance that has been applied to produce a level of capability and solutions to problems that occur [10]. COBIT 5 was chosen because the framework has a broad scope in the domain in it by covering the focus of the company's problems that are currently faced so that the results that will be obtained in the form of recommendations and gaps that occur will be more accurate and can guide the application of IT in line with the vision, mission, and strategy of the company that has been expected.

2. METHODS

Figure 1. is the framework that will be used to conduct research that will be carried out related to measuring and knowing the level of information technology governance capabilities applied [11]. Here is an explanation of the frame of mind.

a) Pre-Interview

At this stage, it is used to conduct pre-interviews with the speakers, namely Mr. Fergianto Godjali, to get information about the initial description of the company, identifying problems, and company goals. The pre-interview process is carried out by sending an email to the source. The result of this stage is to get existing problems and company information.

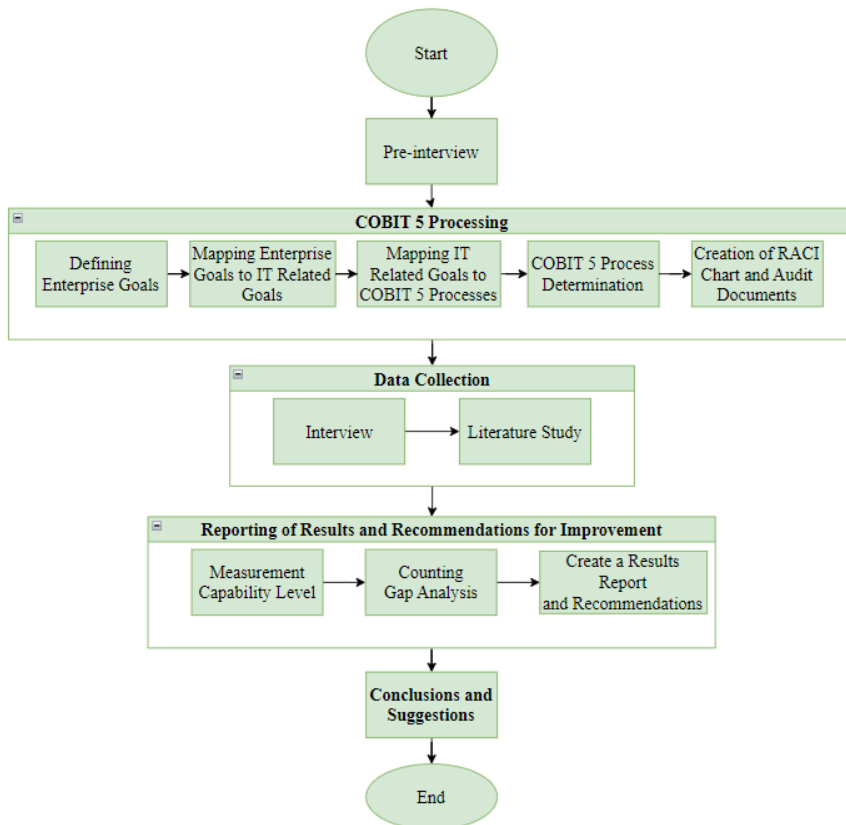


Figure 1. Research Framework

b) COBIT 5 Processing

At this stage, known problem data, based on the results of the pre-interview, will be mapped into enterprise goals by discussing back with the speakers. After the enterprise goals are determined, Mapping Enterprise Goals to IT Related Goals will be carried out. After that mapping, IT Related Goals into the COBIT 5 process using IT Related Goals that have been selected into the COBIT process. At this stage, the COBIT 5 process will also be selected based on Primary and Secondary [12]. A calculation will be carried out in the primary COBIT 5 process to determine which primary process appears more often. Thus, the most dominant COBIT process will be obtained, which will be discussed with the resource person to choose which process to audit based on the company's needs. The stage also creates a RACI Chart and audit documents based on the selected process[13]. The result of this stage is the Selected COBIT 5 process, RACI Chart, and audit documents.

c) Data Collection

At the data collection stage, data will be obtained based on interviews with selected speakers in the IT and business fields and literature studies based on audit documents that have been made in the previous stage. interviews and literature studies are conducted to produce findings and constraints from the company and also to obtain the value of existing capabilities for the next stage. This stage produces data that will be used to assess the company based on the activities in the audit document and provide value to each activity.

d) Reporting of Results and Recommendations for Improvement

At this stage, the assessment of audit document activities will be measured into the Capability Level following the results of the selected COBIT 5 process value. After the capability level is obtained in each selected process, the next step is to conduct a gap analysis between the existing conditions in each selected COBIT process and the target to find out the findings that can be considered as suggestions and recommendations for improvement, if There is a gap in the level of capability that exists with the company's expectations. This stage is also carried out by making an audit report containing findings, Capability Level, gap analysis, and recommendations for improvements for the company as information on improvements to make improvements.

e) Suggestions and Recommendations

At this stage, the results of each stage will be made into a conclusion by considering the critical points at each stage. At this stage, the results and recommendations obtained from the audit process that has been carried out on the company are also carried out. The company can use recommendations and results from existing audits to make improvements and improvements so that the governance of information technology in the company can improve as expected and be a reference for future improvements.

2.1. Data Collection Technique

The data collection technique that I use is the qualitative method by doing the following:

- a) Interviews were conducted with selected stakeholders to serve as resource persons as a reference for selecting domains.
- b) Library Studies based on COBIT Isaca's book.
- c) Questionnaires conducted by asking questions to selected informants using selected sub-process activities based on COBIT 5 and displayed in audit documents.

2.2. Data Sampling Technique

Purposive Sampling is taking the selected sample because of specific characteristics. In this study, Sampling was conducted on users directly related to information technology, namely IT Managers, and the business side, namely Accounting and Tax Managers. Sampling was also carried out by adjusting the roles and responsibilities using the RACI table.

2.3. Data Analysis Technique

There are 3 data analysis techniques used:

a) Capability Level

Measuring the level of capability at this stage is done by looking at the assessment of the answers given by the relevant informants during the interview process for each selected COBIT 5 process activity. The value obtained will be averaged, and the average value of existing processes and sub-processes will be used to measure the company's capability level following the existing conditions[14].

b) Gap Analysis

The GAP analysis in this study was based on a comparison that compared the value of the capability level expected by the company with the actual situation by looking at the calculations that had been carried out. The results of this analysis can be used to provide basic recommendations for improvement for the company so that it can meet the expected expectations and improve the company[15].

c) Rating Scale

At this stage, the rating scale is carried out to find out the achievements obtained by PT XYZ to determine the level of capability in each process which will be assessed with the following rating scale:

1. Not Achieved, with a value between 0 – 15%
2. Partially Achieved, with a value between 15 – 50%
3. Largely Achieved, with a value between 50 – 85%
4. Fully Achieved, with a value between – 100%

In obtaining the average value of the results of data collection that has been carried out, Microsoft Excel is used to calculate the data that has been obtained and to perform calculations starting from the average and the total value according to the activities obtained in each selected COBIT 5 process later[16].

3. RESULTS AND DISCUSSION

3.1. Pre-Interview

In this study, pre-interviews were conducted at the beginning of the report. This pre-interview was conducted with the main informant, Mr. Fergianto, using Gmail to give questions and answers. This pre-interview resulted in an initial description of the company, such as the company's Vision, Mission, Objectives, Profile, Systems, and Organizational Structure, both the entire information technology division and the selected departments, to be used as research material. The pre-interview also yields information on problems that occur in the company and data taken at random for the confidentiality of company data.

3.2. COBIT 5 Processing

Data processing uses the COBIT 5 framework guide. Data processing is done by discussing with selected sources, Mr. Fergianto, through Google Meet. The results of data processing from the pre-interview are as follows:

1) Determining Enterprise Goals

At this stage, the process of determining Enterprise Goals is carried out by taking into account the vision, mission, and objectives. as well as the problems that exist in the company that has been adapted to the wishes of the sources with the seventeen Enterprise Goals in COBIT 5. The following is a list of selected Enterprise goals, as shown in Table 3.

Table 3 Mapping company Vision and Problems with COBIT 5 Enterprise Goals

Company Vision, Mission and Goals	Code	COBIT 5 Enterprise Goals	BSC Dimension
To become an integrated and sustainable worldwide apparel supply company	7	Business service continuity and availability	Customers
Internet and VPN connection is interrupted/disconnected on centralized database usage	11	Optimization of business process functionality	Internal
	14	Operational and staff productivity	Internal
Damage to computer hardware in the form of mouse, keyboard, power supply, monitor, wifi adapter	11	Optimization of business process functionality	Internal
	14	Operational and staff productivity	Internal
Discrepancies in SOP compliance between existing human resources (HR) in	15	Compliance with internal policies	Internal
	16	Skilled and motivated people	Learning and Growth

Company Vision, Mission and Goals	Code	COBIT 5 Enterprise Goals	BSC Dimension
understanding the applicable information technology SOPs			

2) Mapping Enterprise Goals to IT Related Goals

At this stage, the selected Enterprise goals from the results of discussions with resource persons will be mapped into IT Related Goals. This process aims to look into the company's technology-related goals. Here are the results of the mapping, as shown in Table 4.

Table 4 Result of Mapping IT Related Goals

Code	IT-related Goals
1	Alignment of IT and business strategy
2	Compliance and IT support for business compliance with external laws and regulations
4	Manage IT related business risks
7	Delivery of IT services according to business needs
8	Adequate use of applications, information and technology solutions
9	IT agility
10	Information security, processing infrastructure and applications
12	Empowerment and support of business processes by integrating applications and technology into business processes
14	Availability of reliable and useful information for decision making
15	IT compliance with internal policies
16	Competent and motivated IT and business personnel

3) Mapping IT Related Goals to Processes

Mapping of IT Related Goals to the COBIT 5 Process resulted in thirty-five COBIT 5 processes selected from the thirty-seven COBIT 5 processes based on the existing primary. The IT Related Goals obtained from the previous stage will be mapped into the COBIT 5 Process. The following is a table of conclusions from the mapping results, as shown in Table 5.

Table 5 Result of Mapping IT Related goals to Process COBIT 5

IT Related Goals	COBIT5 Process
IT Related Goals 1	EDM01, EDM02, APO01, APO02, APO03, APO05, APO07, APO08, BAI01, BAI02
IT Related Goals 2	APO01, APO12, APO13, BAI10, DSS05, MEA02, MEA03

IT Related Goals	COBIT5 Process
IT Related Goals 4	EDM01, APO10, APO12, APO13, BAI01, BAI06, DSS01, DSS02, DSS03, DSS04, DSS05, DSS06, MEA01, MEA02, MEA03
IT Related Goals 7	EDM01, EDM02, EDM05, APO02, APO08, APO09, APO10, APO11, BAI02, BAI03, BAI04, BAI06, DSS01, DSS02, DSS03, DSS04, DSS06, MEA01
IT Related Goals 8	APO04, BAI05, BAI07
IT Related Goals 9	EDM04, APO01, APO03, APO04, APO10, BAI08
IT Related Goals 10	EDM03, APO12, APO13, BAI06, DSS05
IT Related Goals 12	APO08, BAI02, BAI07
IT Related Goals 14	APO09, APO13, BAI04, DSS03, DSS04
IT Related Goals 15	EDM03, APO01, MEA01, MEA02
IT Related Goals 16	EDM04, APO01, APO07

4) Determination of the COBIT 5 Process

The selected COBIT 5 process from the previous stage will be discussed with the resource persons at this stage. Resource persons and researchers discussed each of the 35 selected COBIT 5 processes. Three processes were selected based on the need to address the problems experienced by this company to measure its information technology governance. The following are three selected processes for further measurement and evaluation:

- a. APO01 Manage the IT Management Framework
Clarify and maintain the governance of the company's IT mission and vision. Implement and maintain mechanisms and authorities to manage information and the use of IT in the enterprise to support governance objectives in line with guiding principles and policies.
- b. APO12 Manage Risk
Identify, assess, and mitigate IT-related risks consistently within the tolerance levels set by the company's executive management[9].
- c. DSS03 Manage Problems
Identify and classify problems and their root causes and make resolutions promptly to prevent recurring incidents. Implement and review recommendations for improvement [8].

Identify and classify problems and their root causes and make resolutions promptly to prevent recurring incidents. Implement and review recommendations for improvement.

The three processes interviewees chose because these three processes focus on the identification process and corporate governance in handling an incident. The problem, problem. This process was chosen by the informants because it is for the company and, according to the informants, to measure and evaluate

information technology governance expertise in overcoming problems that arise, as well as for the level of problem evaluation within the company.

5) Preparation of RACI Chart and Audit Documents

At this stage, the RACI Chart is made to determine the responsible informants in the interview process in the selected domain. In its creation, the RACI Chart is also based on the division of tasks and authority within the PT XYZ company.

3.3. Data collection

At this stage, data collection by conducting interviews and a literature study. Interviews were conducted with selected informants based on the results of the RACI Chart designated by the letter R. Based on the existing RACI Chart results, and there were two informants, namely IT Manager and Accounting and Tax Manager. The interviews were conducted based on the selected COBIT 5 process activities and the guidelines contained in the COBIT 5 ISACA. The selected informants gave and answered each activity answer with 0 as the lowest value and 100 as the highest value.

3.4. Reporting of Results and Recommendations for Improvement

1) Capability Level Measurement

Capability level measurement is done by calculating the average value based on the process value and subprocesses obtained in the previous stage. The following is an average calculation obtained from each selected COBIT 5 process; APO01 is 80.34%, APO12 is 72.76%, DSS03 is 73.27%.

2) Gap Analysis Calculation

This stage will measure gap analysis to find out the current conditions in the company and compare the company's expected conditions. The current conditions are obtained from interviews with selected speakers from business and IT, while the conditions expected by the company are obtained by conducting interviews with the main speakers. The results is shown in Table 6.

Table 6 Gap Analysis Result

Process	Capability Level		Gap Analysis
	Target	Assessed	
APO01	2	1	1
APO12	2	1	1
DSS03	2	1	1

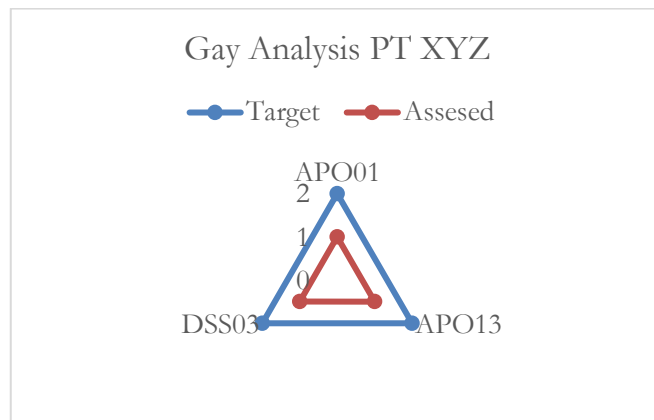


Figure 2 Graphic Gap Analysis

Based on the Figure 2, the results of the gaps that occur in each process. It can be seen that each process experiences a gap between the current condition of level 1 and the expected condition of level 2, with a ratio of 1 level in each process. Based on the results of the gap, improvement recommendations are needed to resolve the findings of the existing findings.

3.5. Create Results and Recommendations Reports

The results report and recommendations will show every finding and impact that occurs and is experienced by the company. This report will also display recommendations for improvements and improvements that can be provided based on COBIT 5 guidelines to correct or minimize problems in each finding that will then be given to the company for evaluation results.

4. CONCLUSION

The evaluation carried out by measuring information technology governance uses COBIT 5, which aims to determine the capability level gaps that occur and recommendations on resource management as suggestions for improvement, the results measuring the capability level with the COBIT 5 process. It was found that there is a level gap between the company's current and expected conditions. With a resulting gap of 1 level where the expected capability level condition is at level 2, and the current condition is at level 1.

There are ten findings and impacts found after measuring three selected processes, which are then given recommendations for improvement to serve as company guidelines for improving and improving IT governance and have been discussed with relevant speakers and accepted and approved for experimentation and

internal company discussions to carry out the recommendations given, in this case, recommendations that should be the company's priority to conduct improvements and improvements in the APO12 - Manage Risk process. This process has recommendations in the form of handling risks, documenting risks in the form of indicators before the emergence of risks and the results of risks, and developing in resolving and preventing risks.

REFERENCES

- [1] J.- Leonidas and J. F. Andry, "Perancangan Enterprise Architecture Pada Pt.Gadingputra Samudra Menggunakan Framework Togaf Adm," *Jurnal Teknoinfo*, vol. 14, no. 2, p. 71, 2020, doi: 10.33365/jti.v14i2.642.
- [2] P. Studi, S. Informasi, F. Teknik, D. A. N. Informatika, and U. M. Nusantara, "Perancangan Arsitektur Enterprise Terhadap Sistem Customer Relationship Management Menggunakan Framework Togaf ADM (Studi Kasus: PT . Indorama)," 2021.
- [3] R. Reynard and W. Wella, "COBIT 5: Tingkat Kapabilitas pada PT Supra Boga Lestari," *Jurnal ULTIMA InfoSys*, vol. 9, no. 1, pp. 18–23, 2018, doi: 10.31937/si.v9i1.712.
- [4] G. Morris William Tangka, A. Tanny Liem, and J. Yuan Mambu, "Information Technology Governance Audit Using the COBIT 5 Framework at XYZ University," *2020 2nd International Conference on Cybernetics and Intelligent System, ICORIS 2020*, 2020, doi: 10.1109/ICORIS50180.2020.9320803.
- [5] ISACA, *A Business Framework for the Governance and Management of Enterprise IT*. 2012.
- [6] D. Zena, G. M. A. Sasmitaa, A. A. Ngurah, and H. Susilaa, "Audit Tata Kelola Teknologi Informasi Pada Dinas Xyz Menggunakan Framework Cobit 5," *Ojs.Unud.Ac.Id*, vol. 2, no. 1, 2021.
- [7] R. Yaniar Sianida, F. Nur Afiana, and R. Wahyudi, "IS Governance Evaluation Using COBIT 5 Framework on the Central Statistics Agency of Banyumas District," *Journal of Computer Science and Engineering (JCSE)*, vol. 1, no. 1, pp. 1–9, 2020, doi: 10.36596/jcse.v1i1.9.
- [8] A. Hanif, M. Giatman, and A. Hadi, "Evaluasi Tata Kelola Teknologi Informasi Di Dinas Komunikasi Dan Informatika Menggunakan Framework Cobit 5," *JST (Jurnal Sains dan Teknologi)*, vol. 9, no. 1, p. 94, 2020, doi: 10.23887/jst-undiksha.v9i1.28401.
- [9] L. D. M. Putri, A. R. Perdanakusuma, and A. Rachmadi, "Evaluasi Maturitas Manajemen Risiko Teknologi Informasi Menggunakan Process

- Assessment Model COBIT 5 (Studi Kasus PT. XYZ Indonesia),” *Jurnal Pengembangan Teknologi Informasi dan Ilmu Komputer*, vol. 3, no. 6, pp. 6089–6098, 2019.
- [10] D. Sanjaya and M. I. Fianty, “Measurement of Capability Level Using COBIT 5 Framework (Case Study: PT Andalan Bunda Bijak),” *Ultima Infosys : Jurnal Ilmu Sistem Informasi*, vol. 13, no. 2, 2022.
- [11] W. Wella and A. F. Tanujaya, “Evaluasi Penyelarasan Strategi Teknologi Informasi dan Strategi Bisnis di PT X Menggunakan Kerangka Kerja COBIT 5.0,” *Jurnal ULTIMA InfoSys*, vol. 8, no. 2, pp. 81–86, 2018, doi: 10.31937/si.v8i2.617.
- [12] K. Pratama Arthananda, “The Role of COBIT5 as a Reference for Quality Service Quality Improvement Case Study: Private Bank in Indonesia,” *Ultima Infosys : Jurnal Ilmu Sistem Informasi*, vol. 12, no. 2, 2021.
- [13] P. P. Thenu, A. F. Wijaya, and C. Rudianto, “Analisis Manajemen Risiko Teknologi Informasi Menggunakan Cobit 5 (Studi Kasus: Pt Global Infotech),” *Jurnal Bina Komputer*, vol. 2, no. 1, pp. 1–13, 2020, doi: 10.33557/binakomputer.v2i1.799.
- [14] M. Muthmainnah, S. Safwandi, M. Jannah, and ..., “Evaluasi Tata Kelola Teknologi Informasi Menggunakan Framework Cobit 5 Proses Dss03 Dan Mea01 Di Universitas X,” *Jurnal Sistem ...*, vol. 6, pp. 1–12, 2021.
- [15] D. Noviandra Kristanto, A. Setiawan, and A. Handojo, “Evaluasi Tata Kelola Teknologi Informasi Dengan Framework COBIT 5 Di Lembaga XYZ Cabang Denpasar,” *Jurnal Infra*, vol. 10, no. 1, 2022.
- [16] Stefanus Prasetyo, “Evaluasi Tata Kelola Teknologi Informasi Menggunakan Framework COBIT 5 (Studi Kasus: PT Praweda Ciptakarsa Informatika),” *Journal of Chemical Information and Modeling*, vol. 53, no. 9, pp. 1689–1699, 2019.