



IT Governance Design Based on COBIT 2019: A Case Study in Telecommunications Company

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Abstract— IT investment in the telecommunications sector, particularly in telecommunications companies, continues to rise year after year. However, due to a lack of attention to good IT management, this increase has not been accompanied by good governance. IT governance measurement is thus required as a foundation for the continuous improvement of telecommunication company IT services. The goal of this research is to develop an application to assess the maturity level of IT governance in government institutions, thereby facilitating the process of improving IT services. The application was created using the COBIT 2019 framework to assist organizations in getting the most out of risk management, governance, and IT. The study's findings included designing corporate IT governance and identifying the main process recommendations for managing education. APO12, DSS02, and DSS03 are three important practical recommendations.

Keywords— IT Governance, COBIT 2019, GAP Analysis, recommendation, goals

I. INTRODUCTION

Information technology have a huge role in telecommunications, it's one of the reasons that us humans can access social media [1], and exchange information from different places in the world [2]. If the grid is down even for only a minute, there's a potential that customers will be disappointed and feels the company is unreliable. A good IT Governance is the one that could support the organization activities in achieving its target, with IT Governance it is hoped that an organization can explore its potential and know its weakness [3].

Previous studies that used COBIT 2019 for the company's IT Governance shows that in education sector they created 5 practical recommendations [4], and in the telecommunications sector they created 14 critical processes for the company [5]. With the help of excellent IT governance, it is possible to conclude that all processes could be carried out and completed effectively.

This study is conducted to audit IT implementation in a telecommunication company. Transparency is one of the most impactful requirements of a stakeholders in IT Governance [6]. In this research, IT Governance design which based on COBIT 2019 framework will be discussed. The advantages of governance design to help in guiding the development in a direction that influences all business core developments and

IT quality in a telecommunication on company that supports the operation so that it could have a standardization of an IT governance guarantee.

II. LITERATURE REVIEW

A. IT Governance

IT Governance is an essential part of an organization consists of leadership, organizational structures, and processes that guarantee the IT supports sustains and extends the organizations strategy and objectives [7]. Failure to implement IT Governance could result in the deployment of ineffective and inefficient technologies, increasing the risk of security and control over technology, reducing the integrity and dependability of information management and finance, and increasing auditing risks. On the other hand, the success of implementing IT governance may assist firms in implementing new technologies more effectively and efficiently to develop business processes, resulting in high value in security and control, greater integrity and dependability of financial information and management, and decreased audit risk [8].

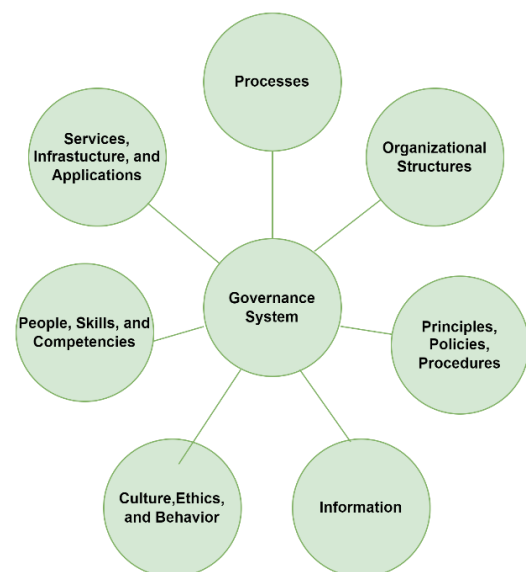


Fig. 1 COBIT Components of a Governance System [9]

Governance ensures that compliance and performance area monitor against agreed-on directions and objectives and stakeholder needs, conditions and options are evaluated to determine balanced, agreed-on enterprise objectives [9].

B. IT Maturity Level

The maturity level of IT governance based on COBIT is a scoring method, from 0 to 5, as shown in Figure 3, that allows organizations to provide assessment for themselves by explaining the IT process to the manager or head, highlighting the weaknesses of the current management, and setting appropriate targets. This measurement tool makes it simple to understand how to determine the current position (as-is) and the future position (to-be), allowing the organization to compare itself to best practices and standard guidelines [10]

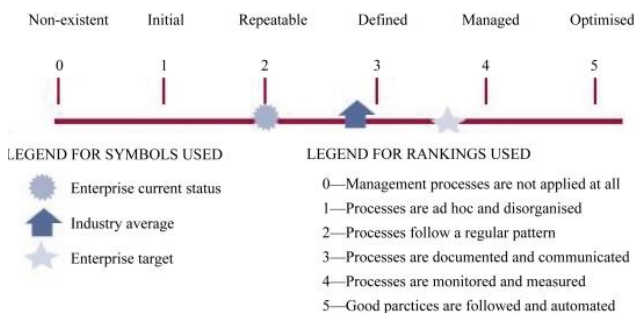


Fig. 2 Maturity Level of IT Governance [9]

C. COBIT

There are various frameworks that could be used to assist organizations with the implementation and assessment of IT governance. The Control Objectives for Information and Related Technology (COBIT) framework is one of them, and it is widely known and recognized as a tool for IT governance [10]. COBIT is an enterprise-wide framework for information and technology governance and management. Enterprise I&T refers to all the technology and information processing that an organization implements to meet its goals, regardless of where this occurs inside the enterprise. In other words, enterprise I&T encompasses more than just an organization's IT department [9]. COBIT is used for IT Governance, it meets the needs between gaps and business risks [11].

III. METHODS

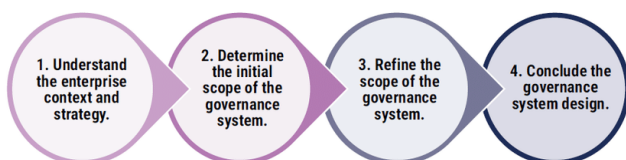


Fig. 3 Methods

The research method used to design IT governance systems indicates a series of stages that can be achieved by using the 2019 COBIT Governance Design Workflow [12].

The design of an IT governance system goes through several stages. In the first process, researchers used XYZ

Telecommunication as a relevant stakeholder to collect and observe data. Based on the design elements provided by COBIT 2019, this stage is the first strategic step to begin the research stage in the form of information and technology-related strategies, goals, directions, and problems. The first step in research methodology is research planning, which includes identifying problems and then conducting environmental observations and employee interviews. Following that, a literature review of the methods and steps used in the level identification process is conducted. The design factor in the COBIT 2019 framework is the method used. The researcher has a governance system from Design Element 1 to Design Element 4 in the second process. In the third process, researchers identified improvements to the governance system for Design Elements 5-10, which are referenced in the COBIT Handbook 2019. The company is expected to have a corporate governance system tailored to the enterprise at the end of the process, as well as an IT governance system that collects all inputs from previous stages to form design conclusions [19].

In addition to this researcher's method or salt flow, we conducted a series of interviews with several employees to obtain relevant validation results to achieve the objectives of this research. We must specify which domains will be used and selected for this study. Activities from the chosen domains are drawn from the COBIT 2019 framework. The number of activities for each domain is based on the activity of the 2019 COBIT Framework. Following the identification of a specific domain, the next step is to identify the respondents to be surveyed. The activity may appear on the list of responders used when asked for the specified domain. The outcome of this process is to obtain the activity's result. The final stage of research planning is to define the target amplitude level that will be used as a reference when performing leveling exercises. Field mapping is used to determine the level of achievement obtained by determining the ability level.

IV. DESIGN AND FUTURE RESEARCH

The research method used to achieve the desired objectives is a qualitative research method, and the research results are descriptive data in the form of written or spoken words of the research observed object. We interviewed one of the Foundation's employees, preferably one in the field of information technology, in order to conduct an assessment and provide feedback on the existing assessment. The scoring system used is one to five, which means that the level applied to a foundation is described in Figure 4, which provides a clear picture of the current capability level according to COBIT 2019.

We also hold discussions and clarify the results to ensure that the assessment is conscious and in accordance with the current conditions at the companies. Mutual acceptance between the two parties will provide an excellent assessment of this research, allowing the research recommendations to be given carefully and in-depth in order to improve the performance and effectiveness of information technology governance at the companies.

In collecting the data and information needed for this IT governance assessment, researchers need to conduct formal and informal interviews to obtain the information needed. The researcher conducted interviews with two stakeholders in the company. Especially employees who are in the field of information and technology, to conduct assessments and

provide questions about existing assessments. The score used is one to five, which means that the level is applied to several foundation components which can be seen in Figure x below. The graph provides an overview of the current capability level using COBIT 2019.

Researchers also discuss and clarify the results to ascertain whether the assessment that has been carried out is appropriate and appropriate to the conditions in the company. A mutual agreement between the two sides will result in an outstanding assessment of the study. So the recommendations from this study can be given carefully and have the opportunity to improve the performance and effectiveness of IT governance in the company.

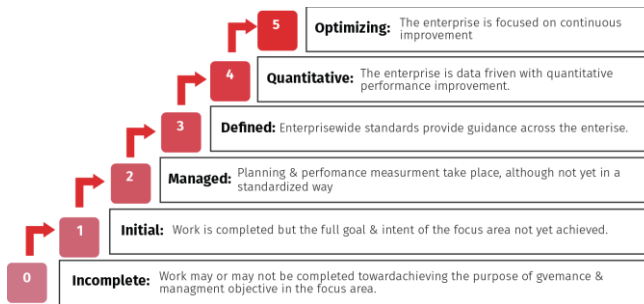


Fig. 4 Capability Level for Process

The form of governance design that results from the phase of

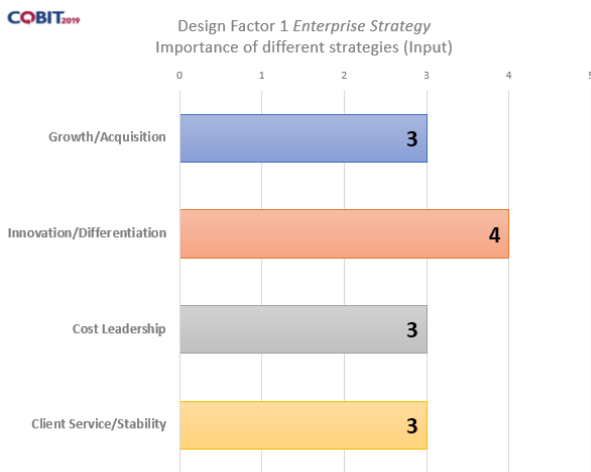


Fig. 5 DF Enterprise Strategy

introducing design elements into COBIT 2019 using the design toolkit is the result of the implementation. The first design element is to define the enterprise or organizational strategy that the telecommunications company will implement using the four COBIT 2019 design toolkit strategies. The results of design element 1 are shown in table 1. This study employs analysis and design to determine the level of corporate governance readiness.

According to the table above, the assessment results show that the XYZ telecommunication company's value of innovation is at level 4. Others, on the other hand, have an average of 3 in terms of growth, stability, and cost leadership. It undoubtedly demonstrates the organization's need for improvisation in increasing this value so that it can be maximized and holistically and the company's strategy can run smoothly.

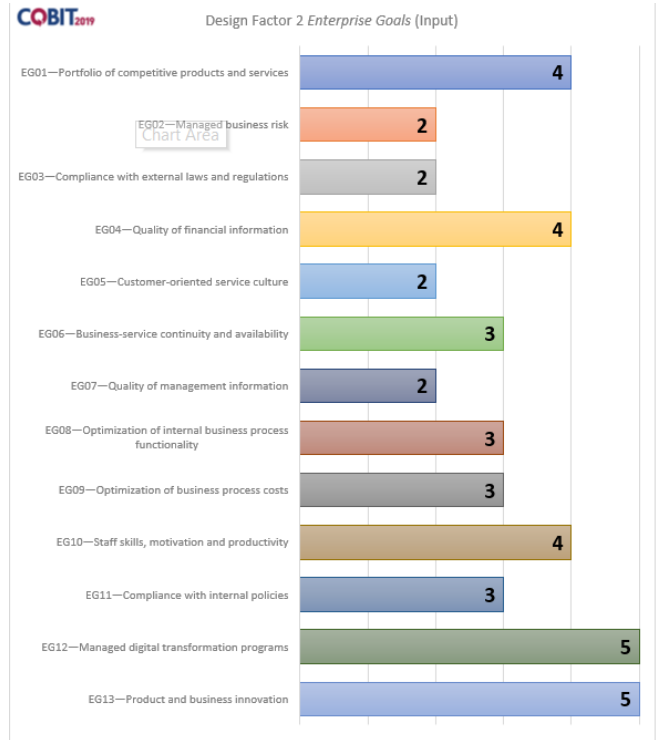


Fig. 6 DF Enterprise Goals

In Figure 7, it can be seen that the areas that need to be upgraded are EG02, EG03, EG05, EG06, EG07, EG08, EG09, EG11. On the other stages EG12 and EG13 are at level 5. That means EG12 and EG13 are good and need maintenance or subsequent development. The result of the third phase is the profile risk of the company. We know that the highest risk lies in logical attacks. This will cause an adverse impact on the security of company data, such as asset data, employee data, company transaction data.

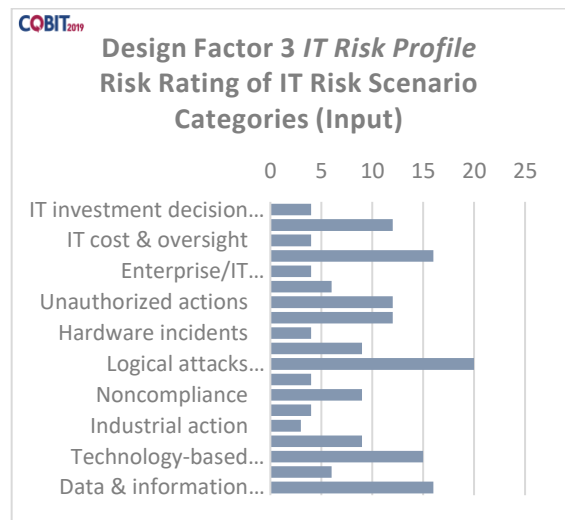


Fig. 7 IT Risk Profile

The design of the element shows the connectedness to IT issues. In this case, in the design they showed the connectedness of the existing factors that allowed this issue to be resolved with an appropriate time frame.

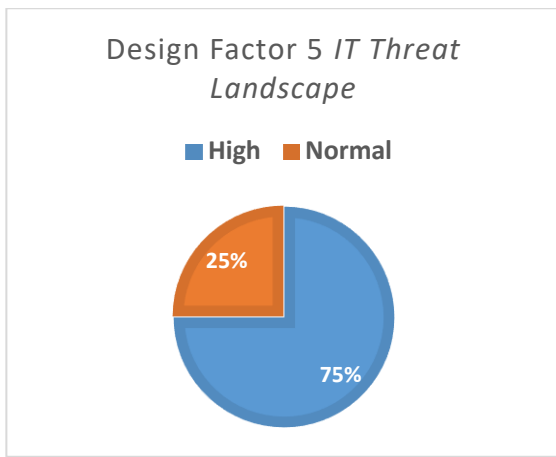


Fig. 8 IT Threat

The fifth phase of the design factor is stage defines an IT threat, to identify potential vital factors. In this case, it can be seen that the threat to telecommunications companies increased by 25%, and for natural threats as much as 85%. If the threat is related to hacking (phishing, ransomware, or other attacks). This should be anticipated early.

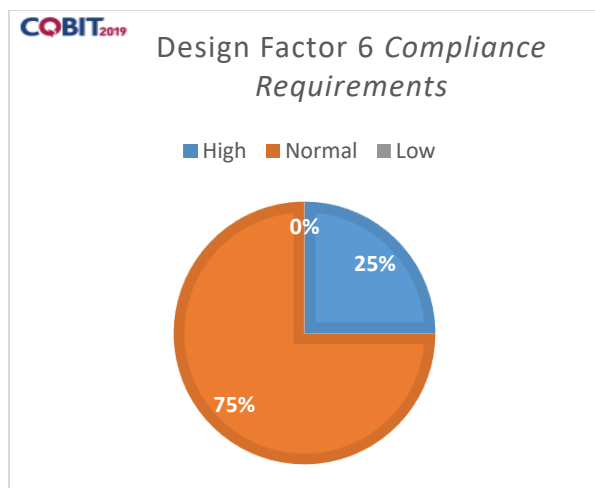


Fig. 9 Compliance Requirement

The seventh design element is the IT resource model. This field was created to modify the XYZ Education Enterprise IT resource model in the IT power model of the COBIT 2019 process. Table 7 shows the results of the determination of eight design elements. It can be seen that Strategic indicates the highest value and turnaround occupies the lowest value based on the assessment.

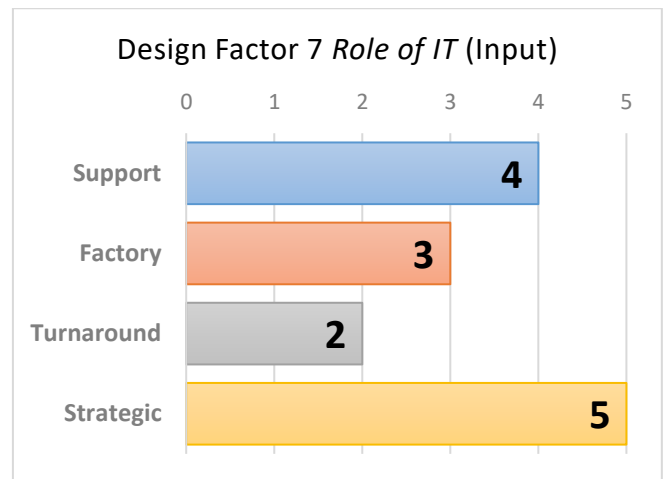


Fig. 10 Role of IT

Below are the results of the determination of the 8th design element of the COBIT 2019 field process, the IT implementation model used by telecommunications companies. Applying agile methods to your applications makes the software development process easier. In addition, agile methods take a relatively fast time and do not require extensive resources. Based on the design elements of the IT implementation, the identified areas are BAI02 and BAI06.

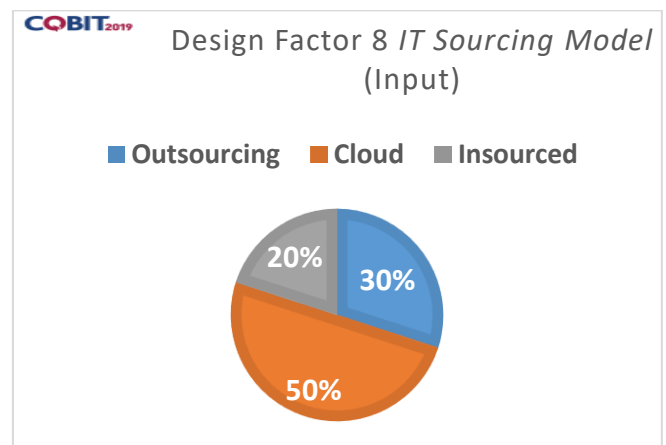


Fig. 11 IT Sourcing Model

The assessment is based on the condition that if the result of the ability level achieved is less than 15%, it will produce N (Not Achieved), if achieved between 15% and 50%, it will produce P (Partially Achieved), if achieved between 50% and 85% it will produce L (Largely). It is achieved, and if achieved by more than 85%, produces F (Fully Achieved), which if the result is F, can proceed to the next level of ability. If the result does not reach F, then the ability level only stops at that level

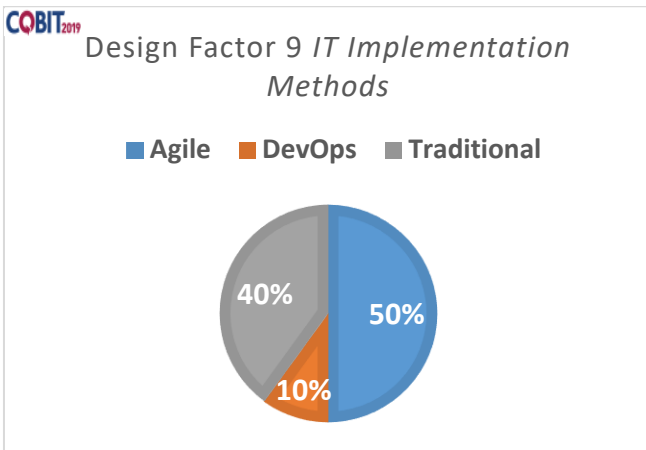


Fig. 12 IT Implementation Methods

The resulting governance design is in the form of a process with a recommended level of capability. COBIT 2019 explains that the expected level of ability to score is more than equal to 80. Requires level 2 ability. Out of 25, the process should reach ability level 1. This research focuses on APO06 and DSS01, where it is necessary to upgrade and improve each domain. APO06 requires clear risk identification and well-managed mitigation by the Foundation. In addition, DSS03 project management improvements are lacking in third-party management and management processes that have not been clearly defined so improvements are needed to DSS01

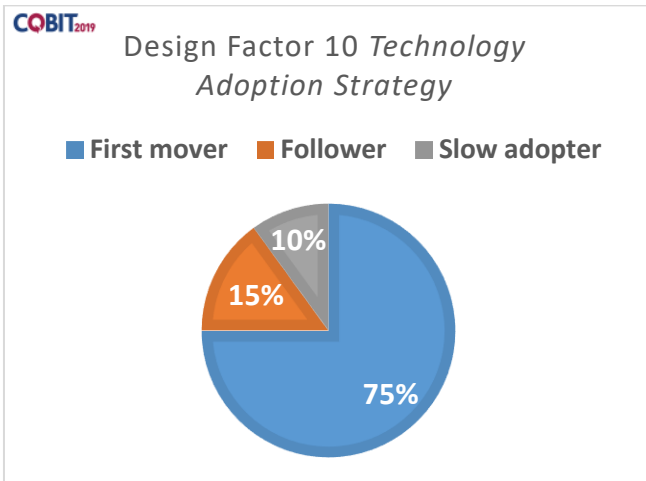


Fig. 13 Technology Adoption Strategy

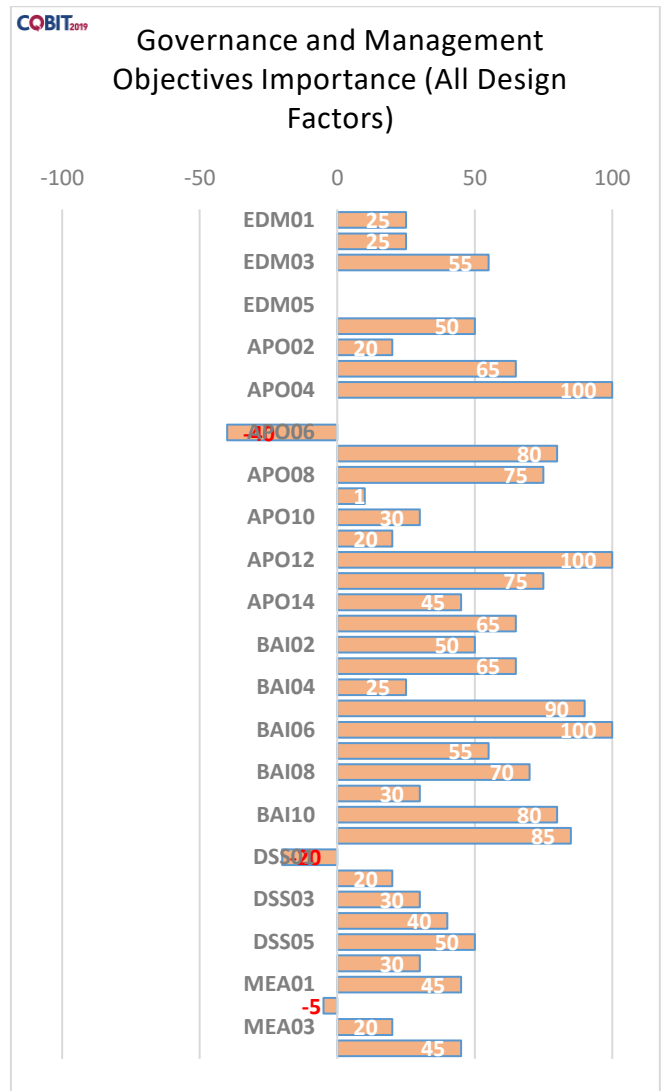


Fig. 14 Governance and Management Objective Importance

V. CONCLUSION

The first step in the process of determining the level of governance is the planning stage which is carried out by formulating the problem and determining the target level. The second step is the data collection from surveying to reviewing the document. Finally, the ability to obtain results is the stage of data analysis made from the calculation of recommendations.

The result shows that APO04, APO12, BAI05 and BAI06 indicates to be at level 4.

We suggest implementing the recommendations issued at this step till you achieve the desired capacity level to enhance QoS control. You also could utilize additional design aspects or areas not included in this research to determine the amount of control.

REFERENCES

- [1] M. M. Alam and S. A. Shaba, "ICT-enabled agricultural extension: How to promote and sustain?," *Information Development*, 2022, doi: 10.1177/02666669221112367.
- [2] A. D. Andrade and B. Doolin, "SPECIAL ISSUE: ICT AND SOCIETAL CHALLENGES INFORMATION AND COMMUNICATION

- TECHNOLOGY AND THE SOCIAL INCLUSION OF REFUGEES 1,” 2016.
- [3] G. Waluyan, E. Kinerja, T. Kelola..., and A. D. Manuputty, “Evaluasi Kinerja Tata Kelola TI Terhadap Penerapan Sistem Informasi Starclick Framework COBIT 5 (Studi Kasus: PT. Telekomunikasi Indonesia, Tbk Semarang),” 2016.
- [4] W. Febriyani, M. I. Alhari, and T. F. Kusumasari, “Design of IT Governance based on Cobit 2019: A Case Study of XYZ Education Foundation,” in *2022 1st International Conference on Information System and Information Technology, ICISIT 2022*, 2022, pp. 289–294. doi: 10.1109/ICISIT54091.2022.9872888.
- [5] G. Waluyan, E. Kinerja, T. Kelola..., and A. D. Manuputty, “Evaluasi Kinerja Tata Kelola TI Terhadap Penerapan Sistem Informasi Starclick Framework COBIT 5 (Studi Kasus: PT. Telekomunikasi Indonesia, Tbk Semarang),” 2016.
- [6] M. Z. M. Alotaibi, M. F. E. Alotibi, and O. M. F. Zraqat, “The Impact of Information Technology Governance in Reducing Cloud Accounting Information Systems Risks in Telecommunications Companies in the State of Kuwait,” *Mod Appl Sci*, vol. 15, no. 1, p. 143, Jan. 2021, doi: 10.5539/mas.v15n1p143.
- [7] S. de Haes and W. van Grembergen, “2004 IT Governance Structures, Processes and Relational Mechanisms IT Governance and Its Mechanisms Figure 1-IT Governance and Corporate Governance Questions Corporate Questions`Corporate Governance Questions,” 2004. [Online]. Available: www.isaca.org.
- [8] A. K. Rama, Suharjito, and E. Gunawan, “Evaluation of IT Governance Implementation Using COBIT 5 Framework and ISO 38500 at Telecommunication Industries,” in *Proceedings of 2020 International Conference on Information Management and Technology, ICIMTech 2020*, Aug. 2020, pp. 453–457. doi: 10.1109/ICIMTech50083.2020.9211275.
- [9] Information Systems Audit and Control Association., *COBIT 2019 Framework Governance and Management Objectives*. 2018.
- [10] D. Steuperaert, “COBIT 2019: A SIGNIFICANT UPDATE,” *EDPACS*, vol. 59, no. 1, pp. 14–18, Jan. 2019, doi: 10.1080/07366981.2019.1578474.
- [11] N. O. Putri, “EVALUASI TATA KELOLA IT PADA PT. TELKOM INDONESIA DENGAN KERANGKA KERJA COBIT 4.1 BERDASARKAN PERSPEKTIF PELAYANAN PELANGGAN PRODUK TELKOM,” 2014.