



Information Technology Governance Using the COBIT 2019 Framework at PT. Bitung Branch Fisheries

Joe Yuan Mambu^{1✉}, Cherry Lumingkewas²

¹Faculty of Computer Science, Universitas Klabat, Indonesia

²Faculty of Economics and Business, Universitas Klabat, Indonesia

joeyuan.mambu@unklab.ac.id

Abstract

Information Technology (IT) governance is crucial for the success of companies in the current digital era. PT. Bitung Branch Fisheries, which operates in the fisheries sector in the Bitung area, faces challenges in effective IT management and governance. Adopting the COBIT 2019 framework, the company hopes to improve operational efficiency, reduce security risks, and ensure regulatory compliance. This research aims to explore the implementation of COBIT 2019 at PT. Bitung branch fisheries, identifying problems and potential improvements, as well as the impact on IT performance and governance. Focus on PT's unique context. The Bitung branch fisheries differentiate it from previous studies, hoping that the results will benefit companies and the IT governance community. Through a comprehensive literature review and research methodology, we analyze the design factors influencing IT governance and COBIT 2019 implementation. The results highlight APO04 as a priority object, indicating the company's attention to IT innovation. However, gaps were found in the current level of capability. We recommend strengthening the implementation of APO04, increasing managerial capabilities, and strategic collaboration to improve IT governance and innovation at the PT. Bitung branch of fisheries. In conclusion, this research provides valuable insights for companies and the IT governance community in implementing COBIT 2019 to improve performance and compliance in the ever-evolving digital era.

Keywords: Information Technology, IT Governance, COBIT 2019, Information Systems.

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1. Introduction

Information Technology (IT) governance has become crucial in supporting company success in the rapidly developing digital era. Companies such as PT. The Bitung branch of Fisheries, which operates in fisheries, especially the Bitung area, faces challenges in effective IT management and governance [1]. To overcome these challenges, companies have adopted IT management frameworks, such as COBIT (Control Objectives for Information and Related Technologies), which was updated by ISACA in 2019 [2]. COBIT 2019 is designed to increase operational efficiency, reduce security risks, and ensure regulatory compliance [3], [4]. The implementation of COBIT 2019 is expected to improve IT governance at PT. Bitung branch fisheries, although facing challenges such as complexity, costs, and resistance to change.

In addition, this research will investigate the implementation of COBIT 2019 at PT. Bitung branch fisheries, to identify problems, potential improvements, and their impact on IT performance and governance. This research also focuses on the unique context of PT. Bitung branch fisheries differentiates it from previous studies that have discussed IT governance and the use of COBIT. Therefore, the results of this research are expected to be useful not only for PT. Bitung branch fisheries but also for the academic community and practitioners in the field of IT governance using COBIT 2019 [5], [6], [7], [8].

2. Method

In this study, several research steps were carried out, according to the sequence shown in the figure:

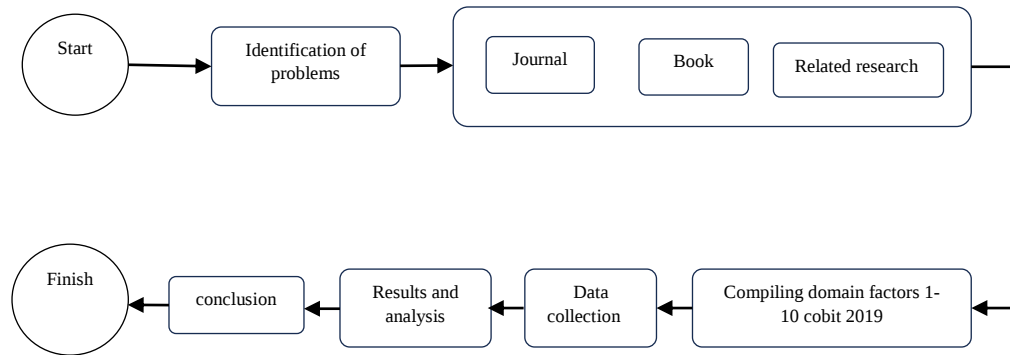


Figure 1. Research methods

2.1 IT Governance

Information Technology (IT) resource management is an important concept in efforts to allocate IT resources within an entity. Strong financial leadership in the village and participatory planning, integrated and aligned with other plans, are important indicators in managing village funds [5]. Apart from that, COBIT 2019 is also a framework that can be used to regulate Information Technology (IT) at the organizational level. IT governance refers to the process of managing and controlling the IT resources owned by an organization to achieve business goals and reduce potential risks [6]. By implementing efficient IT governance, organizations can be more successful in managing risks and achieving their business goals [5]. COBIT 2019 can serve as a tool to evaluate IT governance in an organization and help identify positive and negative aspects of IT management [3], [4], [9], [10].

2.2. COBIT 2019

COBIT is one of the frameworks used in audit standards. This framework was developed by the IT Governance Institute (ITGI), which is also part of ISACA [11]. COBIT provides a set of guidelines and instructions that help guide information technology management. It helps management, auditors, and users identify business risks, needs, and other issues that may arise when information technology is implemented. With advances in technology, COBIT continues to develop [12].

COBIT 2019 is a framework commonly used to assess information technology management in organizations [13], [14], [15]. The focus is on controlling and increasing the value of information and technology. The development of COBIT 2019 was triggered by the need for organizations to manage information technology responsively, efficiently, and in line with their goals, with efforts to avoid duplication [12], [16].

Design factors are factors that can position and influence the design of a corporate governance system using Information Technology [17].

2.2.1 Design Factor 1 (Enterprise Strategy)

Each company has a variety of strategies that suit its business field. In the context of this factor design, several types of company strategies can be implemented. Some of these are company growth strategies that emphasize increasing expansion, strategies that focus on product and service innovation to meet customer needs, strategies that are oriented towards reducing costs in both the short and long term, and focus on providing stable and client-oriented services[1].

2.2.2. Design Factor 2 (Enterprise Goals)

Factor 2 design is a stage that focuses on determining company goals. There are 13 Enterprise Goals (EG) related to Design Factor 2, starting from EG1 which refers to the portfolio of competing products and services, EG02 which emphasizes business risk management, EG03 which relates to compliance with external laws and regulations, EG04 which highlights the quality of financial information, EG05 which focuses on customer service culture, EG06 which considers the continuity and availability of business services, EG07 which prioritizes the quality of information management, EG08 which targets the optimization of internal business process functionality, EG09 which prioritizes the optimization of business process costs, EG10 which relates to staff skills, motivation and productivity, EG11 which relates to compliance with internal policies, EG12 which refers to managing digital transformation programs, and EG13 which focuses on product and business innovation. The value assessment is given on a scale of 5 very important, 4 important, 3 quite important, 2 less important, and 1 not important.

2.2.3. Design Factor 3 (Risk Profile)

Describing a company's risk profile involves an in-depth understanding of the various possible risk scenarios that may impact the company, as well as an assessment of the level of impact and likelihood of each risk occurring. Therefore, a comprehensive risk analysis of the company is needed to reduce the potential negative impacts that could arise as a result of every decision taken.

2.2.4. Design Factor 4 (IT-Related Issue)

At the design stage, factor 4 identified and analyzed existing IT-related issues. Identification is carried out by considering IT-related issues that are being faced or risks that have occurred. Issues related to the IT sector must be identified in the context of the criteria listed in the COBIT 2019 framework so that they can be used to address problems that arise in the future more effectively. The assessment of IT-related issues is adjusted to their level of importance, namely 1 No Issue, 2 Issues, 3 Serious Issues.

2.2.5. Design Factor 5 (Threat Landscape)

The threats faced by companies are also one of the main considerations in designing an appropriate governance system. Two types of threats are commonly encountered, namely, threats that are classified as normal and threats at a high level.

2.2.6. Design Factor 6 (Compliance Requirement)

The needs and demands that must be met by the company are one of the important factors at this stage. There are 3 types of compliance needs/demands, namely low, normal, and high.

2.2.7. Design Factor 7 (Role of IT)

The role of information technology (IT) in companies also has great significance, where companies can evaluate whether IT functions as a support, operational facilitator (factory), turnaround, or strategic element.

2.2.8. Design Factor 8 (Sourcing Model of IT)

The transfer of information technology (IT) management implemented in companies generally involves a choice of IT service models, such as outsourcing, cloud computing, and insourcing.

2.2.9. Design Factor 9 (IT Implementation Methods)

In this factor design phase, researchers investigate three approaches used by companies in software development. The three approaches include:

1. Agile, a method that involves iteratively developing software to increase flexibility and responsiveness in development.
2. DevOps, which includes the integration of culture, implementation, and tools used to enhance an organization's ability to develop, implement, and deliver software services quickly.
3. Traditional Methods, which are related to IT development using a more conventional approach. This research aims to understand how companies adopt and apply these methods in their software development.

2.2.10 Design Factor 10 (Technology Adoption Strategy)

Strategies for adopting new technology within a company can vary. Three types of approaches can be used. First, is the "Pioneer Approach" (First Mover), where the company always strives to adopt new technology as soon as possible. Second, is the "Follower Approach", where the company waits until the innovation has been tested by others before following suit. Third is the "Slow Adopter Approach", where companies adopt new technology very carefully and over a longer period.

2.3. Data collection

The following stage is data collection, where is primary data collected directly from interviews with the Bitung branch of the Indonesian fishing company with interview results based on questions in COBIT 2019 with 10 design factors [4], [18], [19], [20].

2.4. NPLF

NPLF is a method that can assess the level of capability of a process. Displays the capability level assessment rating based on the NPLF method. The following is an explanation of the NPLF method:

1. N (Not Achieved) 0% - to 15%: There is no evidence of activity achievement on the attributes of the process being assessed.

2. P (Partially Achieved) 15% - to 50%: Partially achieved as evidenced by the existence of some evidence of achievement of process attributes.
3. L (Largely Achieved) 50% - to 85%: Most were achieved as evidenced by evidence of a systematic approach and evidence of significant achievement of the process attributes assessed.
4. F (Fully Achieved) 85% - to 100%: All have been fully achieved as evidenced by evidence of a systematic approach and evidence of significant achievement of the process attributes assessed.

3. Results and Discussion

3.1.1 Enterprise Strategy

Factor 1 (Enterprise Strategy) design stage is a stage carried out by the company to identify business strategy. There are 4 types of company strategy, namely growth/acquisition which focuses on company development, the second is innovation/differentiation which focuses on company clients such as offering products, services, and innovation. The third is cost leadership, where the company focuses on minimizing short-term costs, and the fourth type, namely client service/stability, which focuses on providing customers with good and stable service. From the results of interviews with the Bitung branch of the Indonesian fisheries company, it was concluded that the Indonesian fisheries company focuses more on client service and innovation by providing the best product service so that buyers are loyal to their products and do not move to other suppliers because based on statements from the Bitung branch of the Indonesian fisheries company, competition The market is very small because there are relatively few buyers in the North Sulawesi area, while there are quite a lot of providers of the same service.

Table 1. Design factor 1

Value	Importance (1-5)	Baseline
Growth/Acquisition	1	3
Innovation/Differentiation	4	3
Cost Leadership	1	3
Client Service/Stability	5	3

3.1.2 Enterprise Goals

In the design stage factor 2 (Enterprise Goals), in this stage, the objectives of the Bitung branch of the Indonesian fishing company are identified in line with the goals of the central company to be achieved. Based on the results of interviews conducted at the Bitung branch of Indonesian Fisheries, Enterprise Goals are the priorities of companies EG3, EG6, EG7, EG9, EG10, EG11, and EG13. From the interview results, Compliance with external laws and regulations & Compliance with internal policies is a top priority because the company is under the auspices of the government. Companies must also have certification for their products and then have legal legality to avoid fatal risks resulting in state losses and could result in prosecution. Furthermore, Business-Service continuity and availability are also very important where the company must not only sell fish once but must be sustainable, and then the company must also look for buyers who will continue. When buyers want to fish, the company has prepared a way to store the fish in the freezer warehouse so that purchases occur continuously. Quality of management information Because now is the digital era, of course, companies have to adapt to technological developments, the company has also implemented a system that is distributed to fishermen to find out where fish are, called Aruna or now Fishlog for digital services related to fisheries. Optimization of business process costs & Product and business innovation is very important and interconnected because the company optimizes costs by carrying out an innovation where when there is fish whose quality is grade 3 up to 4, the part of the fish that has grade 4 quality is separated from the other parts. so it can increase the price of the product. Staff skills, motivation, and productivity are also very important for companies because when employees recruited do not have skills it will be detrimental to the company, plus with technological developments, employees are required to have skills so that they are not replaced by robots. Companies choose to hire people who have only graduated from high school and are paid poorly rather than graduates who have no skills and are paid highly, which will be costly for the company.

Table 2. Design Factor 2

Value	Importance (1-5)	Baseline
EG01—Portfolio of competitive products and services	4	3
EG02—Managed business risk	4	3
EG03—Compliance with external laws and regulations	5	3
EG04—Quality of financial information	4	3
EG05—Customer-oriented service culture	4	3
EG06—Business-service continuity and availability	5	3
EG07—Quality of management information	5	3
EG08—Optimization of internal business process functionality	4	3
EG09—Optimization of business process costs	5	3
EG10—Staff skills, motivation and productivity	4	3
EG11—Compliance with internal policies	5	3
EG12—Managed digital transformation programs	4	3
EG13—Product and business innovation	5	3

3.1.3 Risk Profile

In the design stage of factor 3 (Risk Profile), in this stage, the risk profile of the Bitung branch of the fishing company is identified. In factor 3 design there are two criteria, namely impact, where if the risk occurs it will have fatal consequences for the company, while the likelihood is the intensity of the risk occurring. Based on interviews conducted at the Bitung branch of the fishing company, it was found that many companies gave several 4-5 on impact due to IT costs, and IT architecture which is expected to help run the company's business to gain large profits will become an obstacle or cause losses if it is not managed and maintained well, therefore the value of impact is given a value of 5 but the value of the probability of an event is given a value 1 because the possibility of errors in managing costs is very small because the company uses a centralized system but it also does not rule out the possibility of errors or unforeseen problems, for example, IT operational incidents or unauthorized actions which have quite a big impact because there could be incorrect data input or data manipulation.

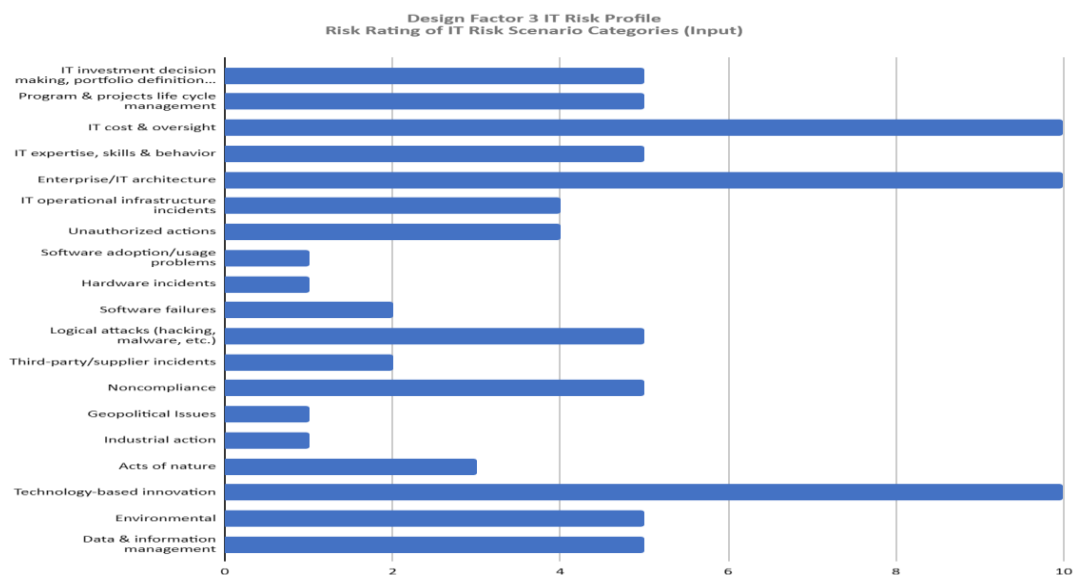


Figure 2. Factor Design Diagram 3

3.1.4 IT-Related Issue

In the design stage, factor 4 (IT Related Issue), in this stage, problems were identified at the Bitung branch of the Indonesian fishing company regarding IT. From the results of interviews regarding IT conflicts faced by the company, namely Based on the results of interviews regarding IT-Related Issues, Many interviewees chose non-issue answers because the problems the questions asked did not have much of an impact on the company.

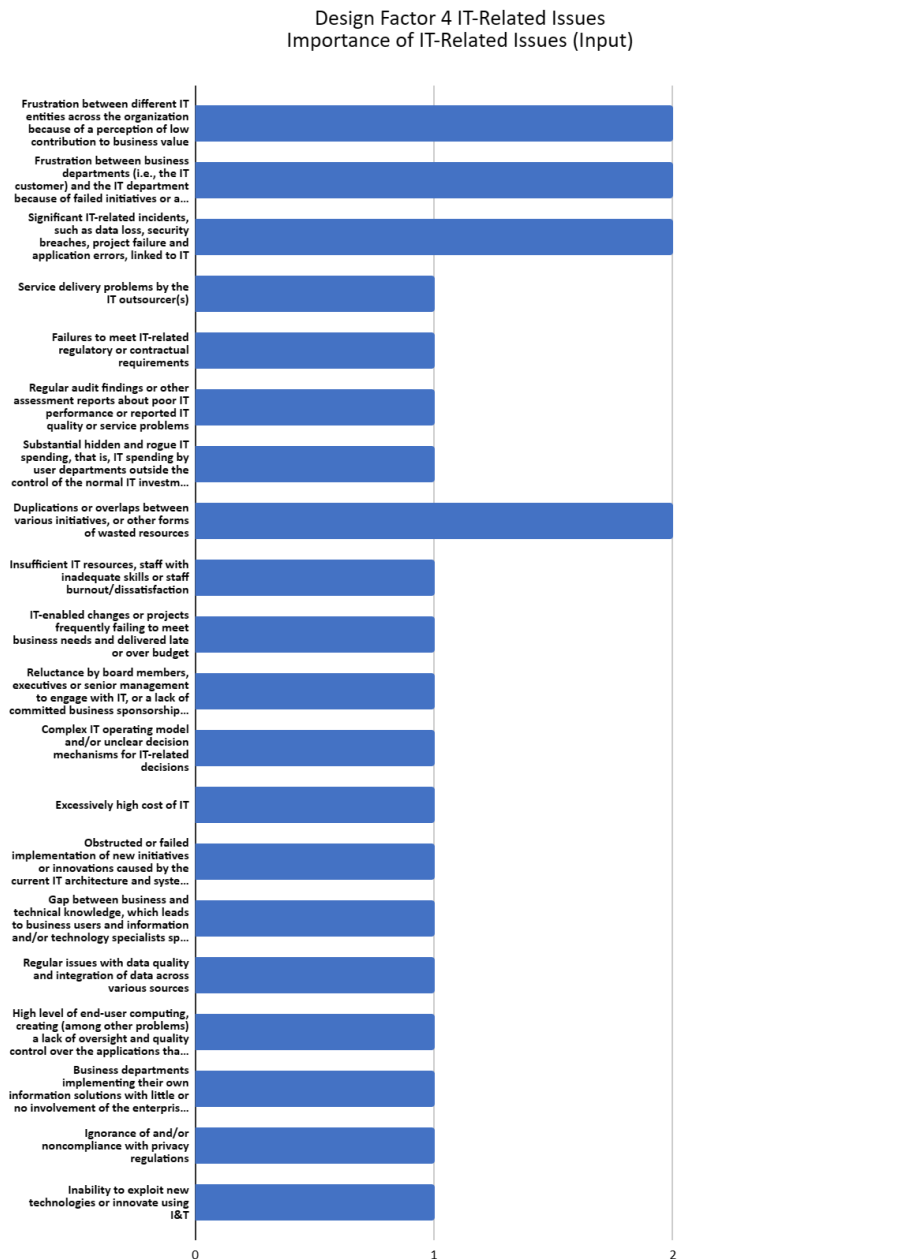


Figure 3. Factor Design Diagram 4

3.1.5 IT Threat Landscape

Factor 5 design stage (IT Threat Landscape) stage of identifying threats that could threaten the company when operating. Based on interviews conducted with Indonesian fishing companies, Threat Landscape, it was found that the threat could be considered normal because the company was located near a port that was easily accessible considering the company was in the fish processing sector.

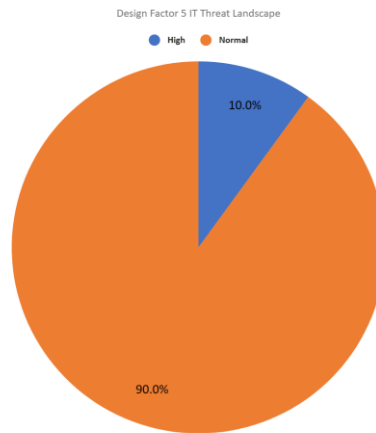


Figure 4. Factor Design Diagram 5

3.1.6 Compliance Requirements

In the design stage, factor 6 (Compliance Requirements), this stage identifies the needs and demands of the company that must be complied with in the operations of the Bitung branch of the Indonesian fishing company. Based on interviews that have been conducted, it was found that the company is part of the government or has a relationship with the government, so PT Perikanan Indonesia Bitung Branch should comply with all applicable regulations to be an example for other companies in terms of how business can have a positive impact on society.

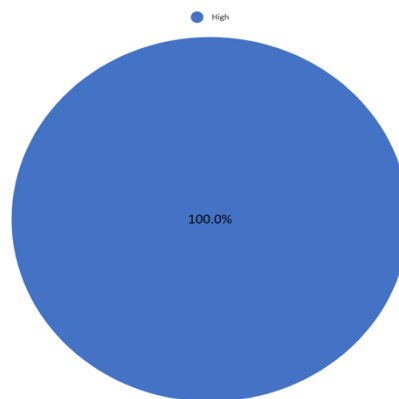


Figure 5. Factor Design Diagram 6

3.1.7 Role of IT

Factor 7 (Role of IT) design stage: This stage identified the role of IT in the Bitung branch of the Indonesian fishing company. Based on interviews that had been conducted, it was found that the Bitung Branch of the Indonesian Fisheries Company chose IT roles such as support, factory, and strategic as very important because this company supports the running of the company. business processes and services or for their innovation, and when IT fails to operate it will directly impact the ongoing business processes and services of this company, However, there is not a critical IT dependency for the running and continuity of current business processes and services.

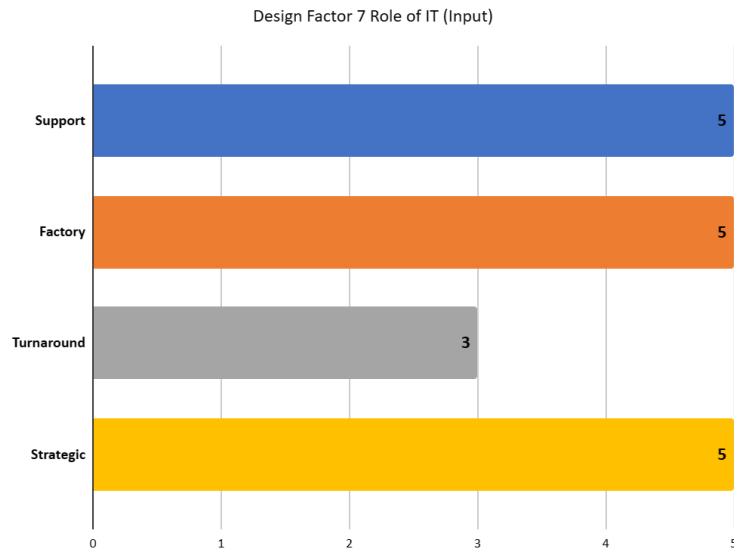


Figure 6. Factor Design Diagram 7

3.1.8 IT Resourcing Model

Factor 8 design stage (*IT Resourcing Model*) This stage identified the source of the model used at the Bitung branch of the Indonesian fishing company. Based on interviews conducted, it was found that the Bitung branch of the Indonesian fishing company.

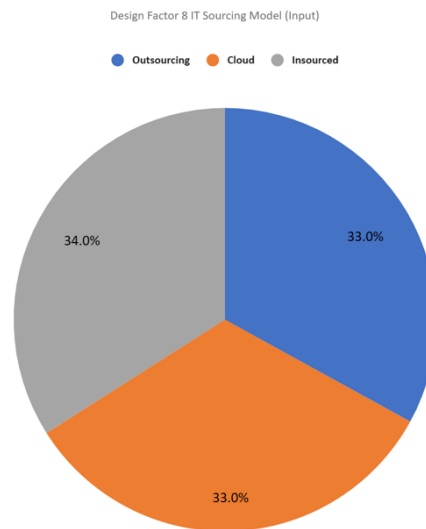


Figure 7. Factor Design Diagram 8

3.1.9 IT Implementation

Factor 9 (IT Implementation) design stage: This stage is identified regarding the IT implementation method used at the Bitung branch of the Indonesian fishing company. Based on interviews that have been conducted, it was found that the Bitung branch of the Indonesian fishing company is only a branch of the Central BUMN, the Bitung Branch has no involvement in developing the software or modules they use for work, but according to sources, The company's software or module development uses Agile. Companies use Agile because they adapt to all departments that will use the software or module. But because the Bitung Branch is just guessing, there is a possibility that the center uses other development methods but from the perspective of the Bitung Branch looking at the adjustments, according to the Bitung Branch it is Agile.

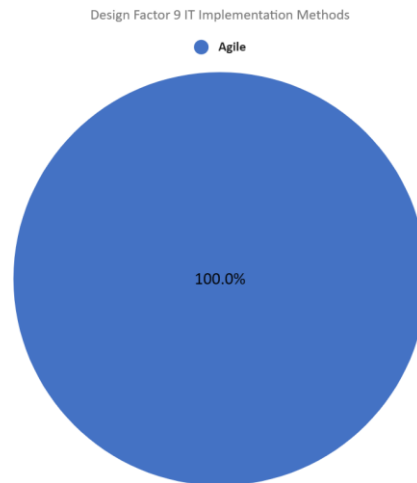


Figure 8. Factor Design Diagram 9

3.1.10 Technology Adaptation

Design factor 10 (Technology Adaptation) at this stage identifies the company's strategy in adopting IT. Based on the results of interviews that have been conducted, it was found that the Bitung branch of the Indonesian fishing company uses a follower strategy, where if there is new technology from the government the company will follow the regulations that have been given. According to sources, companies using a slow adopter strategy mean that it takes a lot of time to adopt new technology and companies have to carry out training. In this case, it depends on the application or technology that will be used in each department, such as accounting, which does not need the latest application updates.

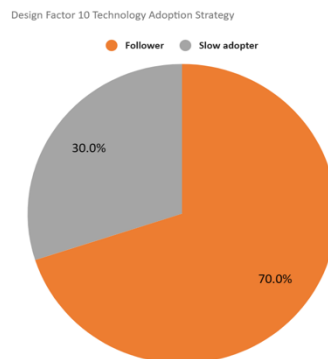


Figure 9. Factor Design Diagram 10

3.2 Second Interview

The results of filling in the 10 design factors found 1 priority objectivity with a value of 100 which was based on and adapted to the company's conditions. The priority objects are APO04-*Managed Innovation*.

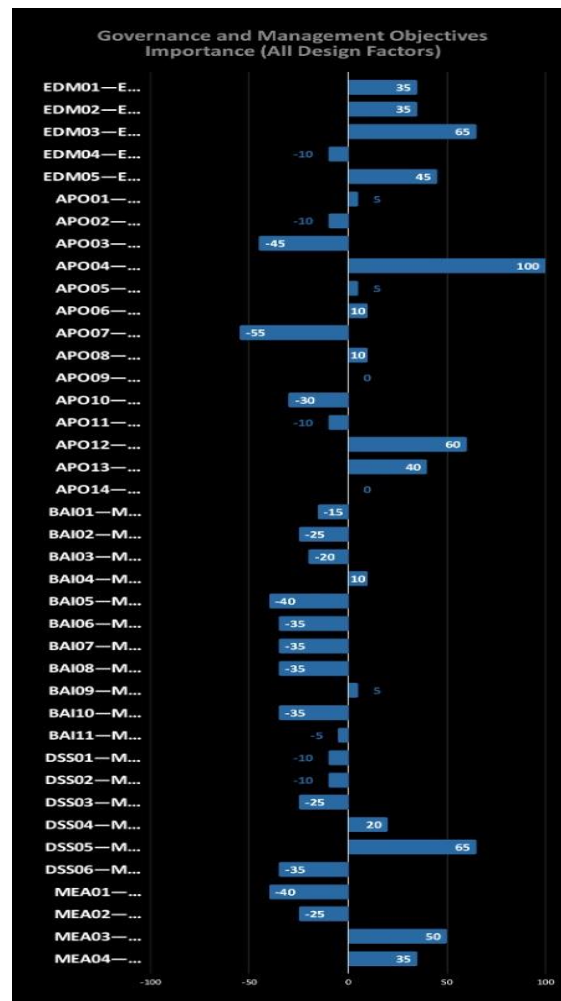


Figure 10. Priority Objectives

3.2.1 APO04 – Managed Innovation

In the APO04 priority objective, there are five activities for level 2 and based on interviews with respondents, all questions can be seen in Table 3.1. All activities asked by researchers have been carried out by PT. Bitung Branch Fisheries.

3.2.2 Activity APO04 Level 2

Table 3. Activity on APO04 Level 2

Aktivitas	Check Box
Create an innovation plan that includes risk appetite, a proposed budget for innovation initiatives, and innovation objectives.	√
Provide infrastructure that can be a governance component for innovation (e.g., collaboration tools for enhancing work between geographic locations and/or divisions).	√
Maintain an understanding of industry and business drivers, enterprise and I&T strategy, and enterprise operations and current challenges. Apply the understanding to identify potential value-added technology and innovate I&T.	√
Understand enterprise appetite and potential for technology innovation. Focus awareness efforts on the most opportune technology innovations.	×
Set up a technology watch process and perform research and scanning of the external environment, including appropriate websites, journals, and conferences, to identify emerging technologies and their potential value to the enterprise.	√

Consult third-party experts as necessary to confirm research or supply information on emerging technologies.	×
Capture IT innovation ideas from staff and review them for potential implementation.	√
Evaluate identified technologies, considering aspects such as time to reach maturity, inherent risk (including potential legal implications), fit with enterprise architecture, and value potential, in line with enterprise and I&T strategy.	×

After calculating the level 2 capability in the APO04 priority objective, the percentage result was 62.5%, which means that based on the NPLF, APO04 level 2 is rated largely or partially achieved so it is declared that it cannot continue with the level 3 capability assessment.

The results that researchers obtained regarding the Design Factor came from the interview process with the IT Department at the Manado Post Office. 10 design factors need to be assessed to obtain results and priorities from IT governance, which aims to obtain corporate IT governance priorities. After analyzing to determine the objective with Design Factor (DF1-DF11), the process objective is obtained which will be further evaluated as shown in the following image:

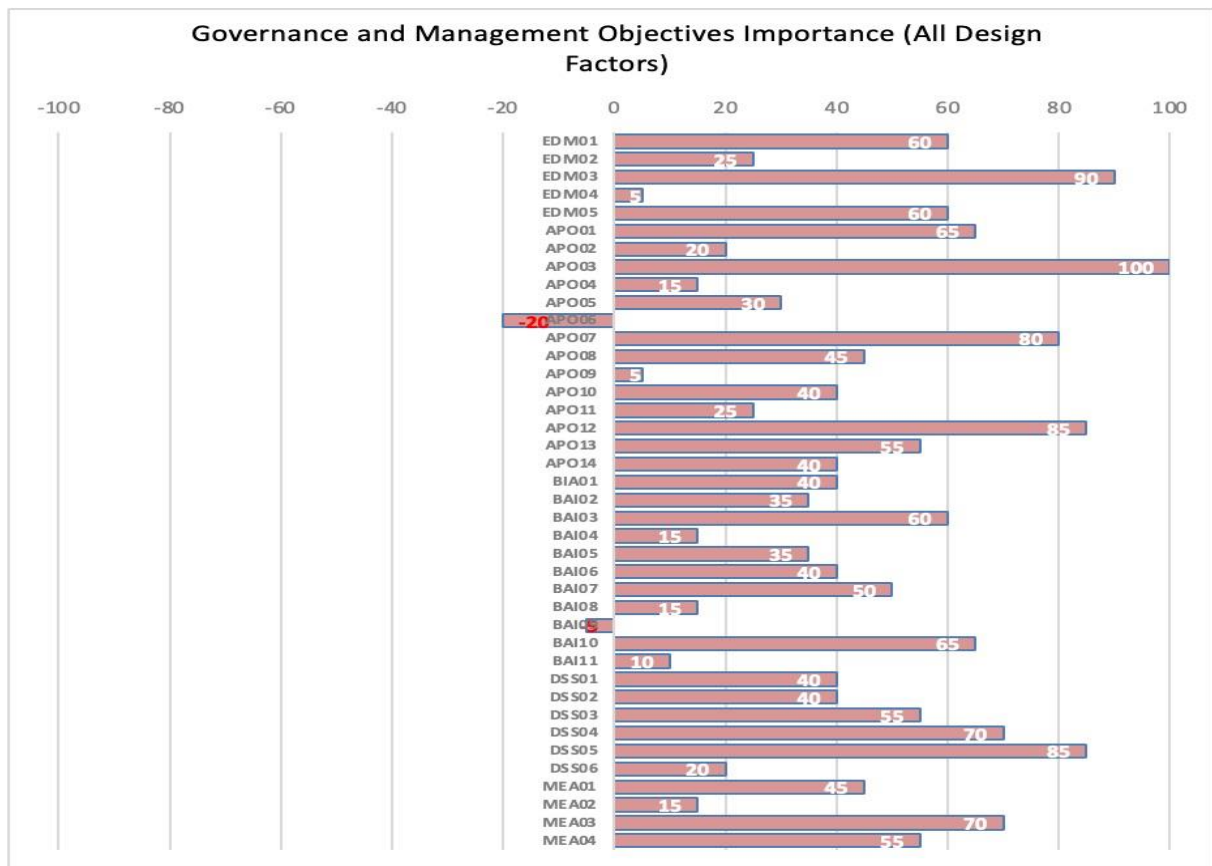


Figure 2. Priority Objectives

The results of filling in the 10 design factors found 2 priority objectives with a value of >95 which were based on and adapted to the company's conditions. The two priority objectives include EDM03 – Ensured Risk Optimization and APO03 – Managed Enterprise Architecture. Based on the results obtained, it will proceed to the core stage.

After the results of the design factors and determining respondents have been obtained, the researcher continues with interviews with respondents who have been determined according to the RACI chart. From the results of these interviews, calculations are made to obtain the capability level for each priority objective which will be categorized according to NPLF [23]. If the results of the capability level for priority objectives do not reach F (fully), then the capability level cannot be continued or stopped at that level [24]. Each priority objective is calculated starting from level 2 capability because it is by what has been determined and written in the COBIT 2019 governance and management objectives book [25].

3.1. EDM03 – Ensured Risk Optimization

Researchers conducted interviews with respondents in the form of activities contained in the EDM03 objective which were used to measure whether MANADO POST had reached the capability level for level 2, level 3, and level 4. These activities were level 2 activities.

3.1.1 Activity EDM03 Level 2

Table 4. Activity on EDM03 Level 2

No	Process Name	Activities	Question	Capability Level	Yes/No
1	EDM03.01 Evaluate risk management.	Understand the organization and its context related to I&T risk.	Does the organization understand the internal and external context that can influence IT risks?	2	yes
2	EDM03.01 Evaluate risk management.	Determine the risk appetite of the organization, i.e., the level of I&T-related risk that the enterprise is willing to take in its pursuit of enterprise objectives.	Has the organization determined the level of risk it is willing to take regarding IT to achieve company goals?	2	yes
3	EDM03.01 Evaluate risk management.	Determine risk tolerance levels against the risk appetite, i.e., temporarily acceptable deviations from the risk appetite.	Has the organization established limits or tolerances for temporary deviations from the desired level of risk (risk appetite)?	2	yes
4	EDM03.01 Evaluate risk management.	Determine the extent of alignment of the I&T risk strategy to the enterprise risk strategy and ensure the risk appetite is below the organization's risk capacity	Has the I&T risk strategy been checked to ensure alignment with the company's risk strategy?	2	no
5	EDM03.02 Direct risk management	Direct the translation and integration of the I&T risk strategy into risk management practices and operational activities.	Are IT risk management practices organized to ensure alignment with IT risk strategies and operational activities?	2	yes
6	EDM03.02 Direct risk management	Direct the development of risk communication plans (covering all levels of the enterprise)	Is the Organization responsible for directing the development of a risk communications plan that covers all levels of the enterprise?	2	yes
7	EDM03.02 Direct risk management	Direct implementation of the appropriate mechanisms to respond quickly to changing risks and report immediately to appropriate levels of management, supported by agreed principles of escalation (what to report, when, where, and how).	Have appropriate mechanisms been implemented to respond quickly to changing risks, and are there agreed escalation principles?	2	yes
8	EDM03.02 Direct risk management	Direct that risks, opportunities, issues, and concerns may be identified and reported by anyone to the appropriate party at any time. Risk should be managed by published policies and procedures and escalated to the relevant decision-makers	Can risks, opportunities, issues, and concerns be identified and reported by anyone to the appropriate parties anywhere and at any time?	2	no
9	EDM03.03 Monitor risk management	Report any risk management issues to the board or executive committee	Are any risk management issues routinely reported to the board or executive committee?	2	yes

Unrealized activities are found in sub-objective EDM03.01, where the fourth activity highlights the process of determining the level of consistency of Information Technology (I&T) risk strategies with the company's risk strategy, as well as in sub-objective EDM03.02, which demands risk identification and reporting, opportunities, problems and fears to relevant entities in a timely and timely manner.

4. Conclusions

Based on the results and analysis of this research, we obtained 1 priority object, namely APO04 managed innovation which has a value of 100. From the results of the company's priority objectives, it pays more attention to innovation in the context of information technology and related technologies. In the results of further analysis on APO04-managed innovation, the results obtained by the Bitung branch of the fishing company had carried out the 5 activities contained in APO04 and it was found that the capability level of the Bitung branch of the Indonesian fishing company was only at level 2. From the calculation results obtained from the APO04 priority objectives, there were 2 gaps in the expected capability level with the current capability level.

Based on the findings found, here are several suggestions that can be submitted to PT. Bitung branch fisheries to improve performance and achievements in managing innovation, especially in the context of information technology and related matters. Here are 3 suggestions we recommend:

1. Strengthening the Implementation of APO04 Activities: Bitung branch fishing companies need to strengthen the implementation of activities related to APO04-managed innovation. This can be done by increasing investment and focusing on activities that support innovation, such as research and development of new technologies, as well as the launch of innovative products and services.
2. Increasing Managerial Capabilities: To achieve the expected level of capability, companies need to improve their managerial capabilities in managing innovation. This includes the creation of a dedicated team to oversee and lead innovation initiatives, as well as the development of clear and measurable strategies to respond to technology trends and market demands.
3. Collaboration and Strategic Partnerships: Companies can strengthen their position in managing innovation by establishing strategic partnerships with research institutions, universities, and other companies in the technology sector. Such collaboration can help in the exchange of knowledge and resources, as well as expanding networks and access to the latest technologies, which can support the achievement of higher levels of capability in managing innovation.

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