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# ANALYSIS OF INFORMATION TECHNOLOGY GOVERNANCE WITH COBIT 2019 ON THE BAI08 DOMAIN TO IMPROVE HIGHER EDUCATION PERFORMANCE (CASE STUDY: INSTITUT XYZ)

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**ABSTRACT**
Information technology governance must be appropriately managed to fulfil company strategy. Determination of the achievement of the capability level in the information technology governance process at the academic administration bureau at the Institut (XZY) as a case study site. This research aims to analyze the implementation of information technology governance and measure the achievement of capability values using COBIT 2019. The findings of the problem were that an evaluation had never been carried out, and lack of knowledge sharing caused a decrease in the quality of governance, so an assessment was needed. The research stages help administrative staff responsible for developing and implementing knowledge and presenting information. Information technology management is carried out to facilitate the management, monitoring, and evaluation of each business process and information technology to achieve organizational goals. COBIT 2019 is used to assist organizations in managing and optimizing existing information technology by using factor design to determine important process domains according to the existing circumstances at the institution. Then, the level of capability in the selected domain BAI08 will be analyzed. The results of measuring the level of capability reached a value of 2.25 at level 2 of the expected goals. The solution to overcome the gap is to recommend improving information technology governance.

## I. INTRODUCTION

INFORMATION technology is not just operational support but is an integral part of increasing a company's competitiveness. It needs to be realized that information technology improves corporate governance practices because it is usually automated, and company leaders, as decision-makers, definitely rely on the information provided by information technology systems [1]. Therefore, information technology has become an integral part of many business processes.

Information technology governance (IT governance) is critical in supporting strategy and achieving organizational goals, including in higher education environments. At XYZ Institute, implementing information technology governance could be more optimal, as seen by the lack of routine evaluations and practical knowledge-sharing mechanisms in the Academic Administration of XYZ. This situation negatively impacts the quality of management and information technology capabilities, ultimately affecting the institution's overall performance. This research aims to analyze the implementation of information technology governance at the XYZ Institute using the COBIT 2019 framework, especially in the BAI08 domain, to measure the capability level and identify existing gaps. The results of this evaluation can provide concrete and applicable recommendations for improvement to increase the effectiveness of information technology governance and support the achievement of the institution's strategic goals.

Information technology governance is an essential issue in companies to optimize service quality. Good governance can make it easier to monitor the effectiveness of information technology performance implemented in the company. IT governance is also essential for companies to achieve their vision, mission, and goals and determine whether the application of information technology is optimal or updated to make it more effective [2].

Governance analysis uses a series of procedures and guidelines to evaluate and achieve the expected strategic goals. Improving company performance requires evaluating IT governance in managing and distributing information. IT governance is essential to ensure strategic alignment with the company's vision, mission, and goals.

To achieve its goals, IT governance has an adequate structure from the planning stage to implementation and evaluation [2] [3].

In the digital era, IT plays a crucial role in improving the performance of higher education institutions. XYZ Institute faced challenges in IT management, including a need for regular evaluation and knowledge sharing among staff, which reduced its IT governance capabilities. This research aims to analyze IT governance at the Academic Administration Bureau of the XYZ Institute using the COBIT 2019 framework, primarily the BAI08 domain. By measuring capability levels and providing recommendations for improvement, this research is expected to increase the effectiveness of IT governance, ensuring IT supports the institute's strategic goals optimally.

Institut XYZ is a private university that implements information technology-based academic governance as a precise, fast, and accurate strategy regarding data and information. The governance of academic administration services requires competent staff who have mastered the technology to carry out the main functional tasks in line with strategic plans and the vision, mission, and goals set. The implementation of information technology within educational institutions has a legal basis in the Regulation of the Ministry of Research, Technology and Higher Education Number 62 of 2017. In order to achieve increased access, relevance, quality of education, and the ability of various knowledge and technology, it is necessary to have integrated information technology management to collect, store, process, and analyze data and information [4].

It plays a vital role in improving the performance of higher education institutions such as the XYZ Institute. However, the lack of regular evaluation and knowledge sharing among staff degrades IT governance capabilities. Standards and regulations in IT governance are essential to ensure IT efficiency and security. COBIT 2019, with compliance with international standards, helps manage and optimize IT. This research analyzes IT governance at the Academic Administration Bureau of the XYZ Institute using COBIT 2019 in the BAI08 domain, measures capabilities, and provides recommendations for improvement to increase the effectiveness of IT governance.

However, challenges in management, such as irregular evaluation and lack of knowledge collaboration, can reduce the effectiveness of governance. Standards and regulations in IT governance are essential to ensure IT security and efficiency. COBIT 2019, focusing on international standards, provides a framework for managing and optimizing IT. This research analyzes the implementation of COBIT 2019 at the Academic Administration Bureau of the XYZ Institute, especially in the BAI08 domain, to provide practical guidance for improving IT governance in higher education.

In the context of academic services and its relevance regarding information technology governance in the aspect of managed knowledge, the role of the Academic Administration Bureau and Data Base Unit prioritizes the effectiveness and efficiency of data management and information publication, as a bridge for sharing internal and external knowledge. However, the current problem is that academic services still need to be minimal due to a lack of knowledge resources. So, this case study was carried out to dig deeper into information technology governance in the research object.

Several information technology governance frameworks are commonly used to evaluate or audit information technology governance in institutions such as ITIL (Information et al. Library), COSO (Committee of Sponsoring Organizations), ISO (International Organization for Standardization), and COBIT (Control Objectives for Information and Related Technologies). ITIL focuses on managing information technology governance in the service sector, and COSO focuses on the organization's internal management. ISO focuses on international standardization in the industrial and commercial fields of the world, and COBIT focuses on objective organizational control [5].

This research uses the COBIT framework, namely COBIT 2019, the latest version that improves the previous version, namely COBIT 5. COBIT 2019 is used to increase the effectiveness of institutional governance and help researchers connect business needs with technical problems. COBIT 2019 has five main domains: EDM, APO, BAI, DSS, and MEA. Each domain has different subdomains and its own subdomain activities. So, this framework can manage information technology in more detail. Compared to COBIT 5, COBIT 2019 is more flexible in creating a governance system aligned with institutional goals [6] [7].

Three framework principles were added to COBIT 2019 to compare with the previous version. The conceptual model referenced in the first principle identifies key components and relationships between components to maximize consistency and enable automation. The openness and flexibility cited in the second principle imply adding new content and the ability to address new problems flexibly, thereby allowing for integrity and consistency.

The third principle indicates that models should be aligned with essential standards, frameworks, and regulations. This explanation shows that COBIT 2019 adequately represents the framework and its predecessor versions.

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COBIT 2019 can align requirements to assess the process with gaps found in measuring capability levels based on selected target domains because, in the previous case study process, there was no research to evaluate IT governance using COBIT 2019 or other frameworks [8].

Referring to previous research conducted by [9] [10], it is attractive to research because the object of the case study has never been evaluated to determine the success and optimization of information technology governance applied to each company. The research stage begins with an analysis of the company's scope. The aim is first to determine the domain using the design toolkit in COBIT 2019. The design factor elements intended are DF1-Company strategy to DF4-IT Related Issues, measuring capability levels, and gap analysis to provide recommendations for increasing capability values [11]. [12] Audit of information technology governance at the Regional Research Institute using the COBIT 2019 framework.

Domain BAI08, Managed Knowledge Management, was chosen as the research focus due to its essential relevance in ensuring the effectiveness of IT governance at XYZ Institute. Good knowledge management supports efficient collaboration and information sharing across institutions and influences an institution's ability to manage academic and administrative operations more efficiently. Measuring capabilities in these domains will provide critical insight into how sound knowledge is managed and leveraged within the institution. It will provide a solid basis for recommending improvements that can improve the overall quality of IT governance.

Domain mapping results concluded in the APO12-Managed Risk and APO13-Managed Security domains. Meanwhile, for the current research, governance analysis using COBIT 2019 focuses on the BAI08-Managed Knowledge domain as a core model that prioritizes measuring the level of capability according to institutional expectations. According to [13], the aim of analyzing and evaluating information technology governance in higher education in the era of digitalization is that it is necessary to pay attention to Good University Governance. In principle, universities need standardization so that all operational mechanisms align with the planning, objectives, and business processes implemented in XYZ.

## II. Research Methods

This type of research is a case study; the researcher analyzes information technology governance using the COBIT 2019 framework and proposes recommendations and improvements to information technology governance from this research gap. The nature of the research is descriptive, presenting a complete picture to explore a phenomenon by describing several data and information related to the IT governance of the unit studied. This research approach uses qualitative methods, which are processed into quantitative ones.

COBIT 2019 was chosen because it provides a structured and comprehensive approach to information technology (IT) governance, meets international standards such as ISO/IEC 27001 and ITIL, and focuses on creating value through the effective use of IT. With flexible factor design, COBIT 2019 allows XYZ Institute to customize its implementation in managing knowledge and IT processes. Measuring capabilities in the BAI08 domain will provide an in-depth understanding of the effectiveness of knowledge management at the institution. This aligns with the research objective of improving IT governance at XYZ Institute.

### *A. Research Flow*

The research steps consist of several stages: literature study, problem identification, data collection using observation and interview techniques, COBIT core model domain staging, data input into the design toolkit, and data collection using questionnaire techniques. The next stage is data analysis, which calculates capability levels and prepares recommendations. The research process is shown in Figure 1.

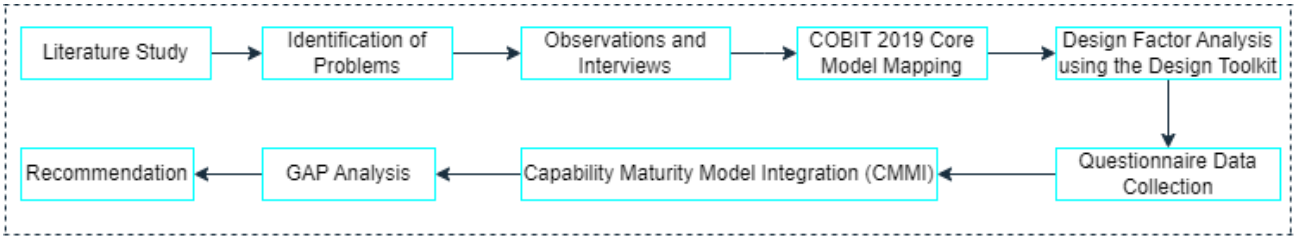


Fig. 1. Research flow

The research stages refer to the COBIT 2019 framework, described as follows:

1) *Object of research*
The object of this research was carried out in the Institut XYZ at the Academic Administration Bureau and the data and information management unit that applies information technology for academic services to stakeholders so that existing findings can be evaluated by IT governance and used as a topic for this research. XYZ Institute faces unique challenges in managing IT to support complex academic and administrative operations as a higher education institution. This study will provide critical insights into how IT governance in higher education environments can be improved through the implementation of COBIT 2019, with a particular focus on the BAI08 domain. This research aims to provide practical guidance that can be adapted to the unique needs of the XYZ Institute in managing knowledge and increasing the effectiveness of the overall use of information technology.
2) *Study of literature*
A literature study is needed to find relevant phenomena from previous research and understand the procedures of COBIT 2019 from the book provided by ISACA as a research reference.
3) *Identify the problem*
Identify the problems in the research object to find out the application of existing governance and find the proper object related to IT governance.
4) *Observations and interviews*
Observations and interviews were conducted to determine the institution's profile, including its vision, mission, goals, and strategic plans for achieving those goals. Observation and interview methods were used to obtain in-depth data about IT governance at the XYZ Institute. Observation allows direct observation of IT management practices, such as information systems and department communication. Meanwhile, interviews with academic administrators, IT, and administrative staff provide their perspectives on challenges, needs, and expectations related to IT governance.
5) *Identify the problem*
Identify the problems in the research object to find out the application of existing governance and find the proper object related to IT governance.
6) *Design mapping*
Mapping design factors starting from enterprise strategy, company goals, risk profile, related issues related to information and technology, IT implementation methods, technology adoption strategies, and company size.
7) *Results mapping*
The mapping results have been processed in the COBIT 2019 canvas design toolkit to obtain Governance and Management Objectives based on the company's vision, mission, and objectives. Data from observations and interviews will be used to measure the level of capability in the BAI08 domain using COBIT 2019. This includes evaluating existing controls and processes and recording the achievement of desired goals.
8) *Result Capability Maturity Model Integration (CMMI)*
The Governance and Management Objectives Importance results in determining one core model as a priority domain; then, measurements are carried out to assess the level of capability. Results from the CMMI will be used to evaluate the level of maturity in core IT governance domains. This evaluation will help set improvement priorities and identify steps to improve overall capabilities. For example, if the current maturity level is level 2, the action plan will focus on reaching level 3 to enhance control and efficiency.
The questionnaire will be distributed to key stakeholders in IT governance at XYZ Institute, such as administrative staff, academic administrators and IT personnel. Data from the questionnaire will be analyzed quantitatively to identify common patterns, similar needs, and differences of opinion. This analysis will support making appropriate recommendations based on the broad views of various stakeholders.
9) *Gap analysis results*
The gap analysis results help propose recommendations for appropriate IT governance improvements. For this purpose, researchers distributed questionnaires to the head of the Academic Administration Bureau, the person in charge of administration, the Higher Education Data Management Unit, the manager of the academic information system, and the sub-unit staff. IT governance with the standards and best practices set out in COBIT 2019. The aim is to identify differences between the actual situation and the expected goals. This analysis is essential because it will formulate specific recommendations to close these gaps through process improvements, developing new policies, or increasing technical and managerial capacity.

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## III. Results and Discussion

The survey's observations and interview results were measured using the Capability Maturity Model Integration (CMMI) method, and based on the findings, the best solutions to improve information technology governance were proposed. This research uses the Capability Maturity Model Integration (CMMI) to evaluate and measure the level of maturity in managing information technology governance at the XYZ Institute. CMMI provides a systematic framework for assessing maturity levels in various domains, including the BAI08 (Manage Knowledge) domain, which is the main focus. Evaluation with CMMI helps identify current capability levels and compare them with desired targets. The results of this evaluation are the basis for formulating specific recommendations for improvement, such as developing a more structured knowledge policy, training to increase awareness about knowledge management, or implementing a more efficient information system.

### *A. Selection of Information Technology Governance Domain*

Based on the data and information obtained from the research object, analysis was carried out to obtain the results needed for this research. The vision, mission, goals, and strategies for adopting information technology in XYZ are aligned with the COBIT 2019 framework. The results of the Enterprise Strategy identification on the canvas toolkit design factor (DF1) are mapped in Table I.

TABLE I
Design Factors (DF1) Enterprise Strategy

| Value | Importance (1-5) | Baseline |
|---|---|---|
| Growth | 4 | 3 |
| Innovation | 3 | 3 |
| Cost Leadership | 2 | 3 |
| Client Service | 5 | 3 |

Table I is the result of strategy analysis on XYZ with the highest weight on service stability and growth. This shows that the strategy implemented at XYZ currently focuses on Client Service/Stability and Growth, namely the provision of stable services with an orientation towards the future growth of the institution by the established strategic plan.

### *B. Alignment Goals*

The next step is analyzing the second design factor (DF2) and determining enterprise goals by identifying institutional goals and objectives. In this process, the Balanced Scorecard (BSC) Dimension approach in COBIT 2019 is a tool for translating comprehensive vision, mission, and goals for performance measurement in developing strategy maps. The results of identifying alignment goals are in Table II.

TABLE II
Alignment Goals

| | Goals and Objectives | BSC Dimensions | Code | Enterprise Goals |
|---|---|---|---|---|
| Vision | The realization of Institut XYZ, which produces teachers and technocrats with integral and professional personalities in 2028 | Growth | EG13 | Product and business innovation |
| Misi | Providing quality education and producing graduates who have moral integrity and superior personalities to society's demands | Internal | EG10 | Staff skills, motivation and productivity |
| | | Growth | EG13 | Product and business innovation |
| | Develop research and community service in the interests of society and the nation | Internal | EG10 | Staff skills, motivation and productivity |
| | Empowering the Institute as a tertiary institution based on the integrated development and application of science, technology, arts, and culture based on resources, national cultural values , and world culture | Internal | EG10 | Staff skills, motiva-tion and productivity |
| | | Growth | EG13 | Product and business innovation |
| Purpose | Educate and produce quality graduates who have high competence and skills in mastering and applying science and technology in an integrated manner | Internal | EG10 | Competitive product and service portfolio |
| | | Growth | EG13 | |
| | Increase the quantity and quality of research through the Science and Technology development strategy to benefit society and the nation | Financial | EG01 | Competitive portfolio and services |
| | | Growth | EG10 | Product and business innovation |
| | Creating a conducive, quality, and independent academic and professional community life through a quality education management system | Internal | EG10 | Product and business innovation |
| | | Growth | EG13 | Staff skills, motivation and productivity |

| | | | |
|---|---|---|---|
| Developing functional and professional institutions in the engineering field that are competitive and sustainable to optimize the existence of Institut XYZ | Financial | EG01 | Competitive product portfolio and services |
| | Growth | EG13 | Staff skills, motivation and productivity |

### *C. Enterprise Goals are mapped in Design Factor 2*

Next, this research will analyze the design factor 2 of the company's goals, which consists of thirteen (13) values, each assessed based on a scale of importance from 1 to 5. This analysis aims to evaluate the extent to which each value contributes to achieving the company's goals and identify areas requiring more attention. The results of this identification process will be presented in detail in Table III, which will display the distribution of these values and provide in-depth insight into the strategic priorities that the company must take. Thus, this research does not only focus on identifying value for corporate planning and decision-making.

TABLE III
ENTERPRISE GOALS DESIGN FACTOR 2

| Code | Value | Importance (1-5) | Baseline |
|---|---|---|---|
| EG01 | Competitive product and service portfolio | 5 | 3 |
| EG02 | Managed business risks | 3 | 3 |
| EG03 | Compliance with external laws and regulations | 2 | 3 |
| EG04 | Quality of financial information | 2 | 3 |
| EG05 | Customer-oriented service culture | 2 | 3 |
| EG06 | Continuity and availability of business services | 3 | 3 |
| EG07 | Quality of management information | 3 | 3 |
| EG08 | Optimization of business process functions | 4 | 3 |
| EG09 | Optimizing business process costs | 3 | 3 |
| EG10 | Staff skills, motivation and productivity | 5 | 3 |
| EG11 | Compliance with internal policies | 3 | 3 |
| EG12 | Managed digital transformation program | 4 | 3 |
| EG13 | Product and business innovation | 5 | 3 |

### *D. Risk Profile Design Factor 3*

After successfully determining the company's objectives, the next step is to ensure that the risk profile of each existing business process is analyzed and prioritized, with the main focus on entities or activities that have the highest level of risk. This analysis includes identifying, evaluating, and measuring risks based on their impact on the company's objectives and the likelihood of their occurrence. The results of this detailed analysis are then mapped in Table IV, which displays the type of risk, risk level, and risk priority based on level, as well as the planned mitigation strategies to manage and reduce these risks. With this approach, companies can focus resources and mitigation efforts on the most significant risks first, thus supporting the effective achievement of company goals.

TABLE IV
RISK PROFILE DESIGN FACTOR 3

| Risk Scenario Category | Impact (1-5) | Likelihood (1-5) | Risk Rating |
|---|---|---|---|
| IT investment decision making, portfolio definition, and maintenance | 4 | 4 | Very High Risk |
| Program and project life cycle management | 3 | 3 | High Risk |
| IT costs and oversight | 2 | 2 | Normal Risk |
| IT skills, skills and attitudes | 4 | 4 | Very High Risk |
| Enterprise/IT architecture | 3 | 3 | High Risk |
| IT operational infrastructure incidents | 3 | 3 | High Risk |
| Unauthorized action | 1 | 1 | Low Risk |
| Problems with adoption or use of software | 2 | 2 | Normal Risk |
| Hardware incident | 3 | 3 | High Risk |
| Software failure | 3 | 3 | High Risk |
| Logical attacks (hacking, malware, etc.) | 2 | 2 | Normal Risk |
| Third party/supplier incidents | 2 | 2 | Normal Risk |
| Disobedient | 1 | 1 | Low Risk |
| Geopolitical issues | 1 | 1 | Low Risk |
| Industrial action | 1 | 1 | Low Risk |
| Natural disasters | 1 | 1 | Low Risk |
| Technology-based innovation | 3 | 3 | High Risk |
| Environment | 2 | 2 | Normal Risk |
| Data and information management | 4 | 4 | Very High Risk |

### *E. IT-Related Issue Design Factor 4*

Based on Table V, which identifies IT-Related Issue Design Factor 4, challenges in information technology management not only affect operational efficiency but also contribute to overall business value. Each issue, from internal frustration between IT entities to failure to meet regulatory requirements and runaway costs, has a significant potential impact.

Solutions to address these issues include increased communication and collaboration between teams, implementation of strict security protocols, better coordination between departments, and increased management involvement and commitment to IT initiatives. These steps can improve operational efficiency and regulatory compliance and help organizations leverage new technologies more effectively.

TABLE V
RELATED ISSUE DESIGN FACTOR 4

| IT-Related Issue | Importance (1-3) |
|---|---|
| Frustration between different IT entities across the organization due to perceived low contribution to business value | 1 |
| Frustration between business units (i.e., IT users) and IT support units due to failed initiatives or perceived low contribution to business value | 1 |
| Significant incidents related to IT, such as data loss, security breaches, project failures, and application errors related to IT | 1 |
| Issues with service delivery by external IT personnel | 2 |
| Failure to meet regulatory or contract requirements related to IT | 3 |
| Routine audit findings or other assessments highlighting poor IT performance or issues with service quality | 2 |
| Substantial hidden IT expenditures, i.e., IT spending by administrative staff outside normal IT investment decision mechanisms and approved budgets | 2 |
| Duplication or overlap between various initiatives, or other forms of wasted resources | 3 |
| IT-supported projects often failing to meet business needs due to late changes or exceeding budgets | 3 |
| Reluctance of management, executives, or senior management to engage in IT matters, or lack of business sponsor commitment to IT | 3 |
| Insufficient IT resources, staff with inadequate skills, or staff fatigue/dissatisfaction | 1 |
| Complex IT operation models and/or unclear decision-making mechanisms related to IT | 1 |
| Excessive IT costs | 1 |
| Implementation of new initiatives or innovations hindered or failed due to current IT architecture and systems | 1 |
| Gap between business and technical knowledge, leading to conflicting information from staff or technology specialists | 1 |
| Regular issues with data quality and data integration across various sources | 1 |
| High end-user computing levels, creating additional issues due to lack of supervision and quality control over developing and operating applications | 2 |
| Business departments implementing their own information solutions with little or no involvement from the corporate IT department | 3 |
| Inability to leverage new technologies or innovate in the use of IT | 2 |

Overall, this research provides an in-depth look at how IT-related issues can impact overall organizational performance and provides practical guidance for implementing solutions that can increase competitiveness and innovation in an ever-changing business environment. By analyzing IT-related issues, find five problems in the serious issue category.

### *F. Design Results Factor 4 IT-Related Issues*

The Stages DF1-DF4, namely Enterprise Strategy, Enterprise Goals, Risk Profile, and IT-related issues, have been analyzed. The weighting of each design factor is the main key in determining the domain. The results of design factor 4 are shown in Figure 2.

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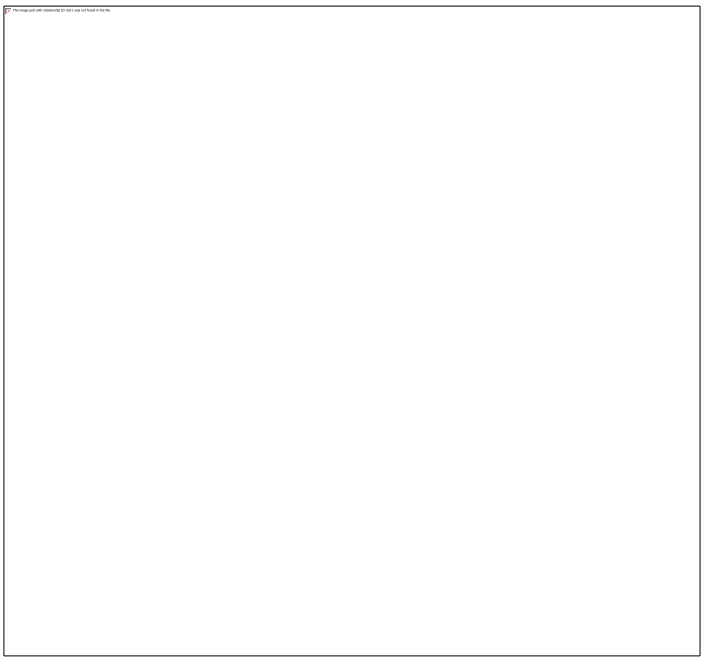

Fig. 2. Design results factor 4 IT-related issues

The results are shown in Figure 3, with the highest bit in BAI08 reaching 100. Based on the factor design mapping results, the BAI08-Manage Knowledge domain has the highest presentation, representing the institution's situation. This shows that this domain is an important domain given more priority than other domains for measuring capability levels. Important domains can be identified from the Governance Score conclusion in Figure 3.

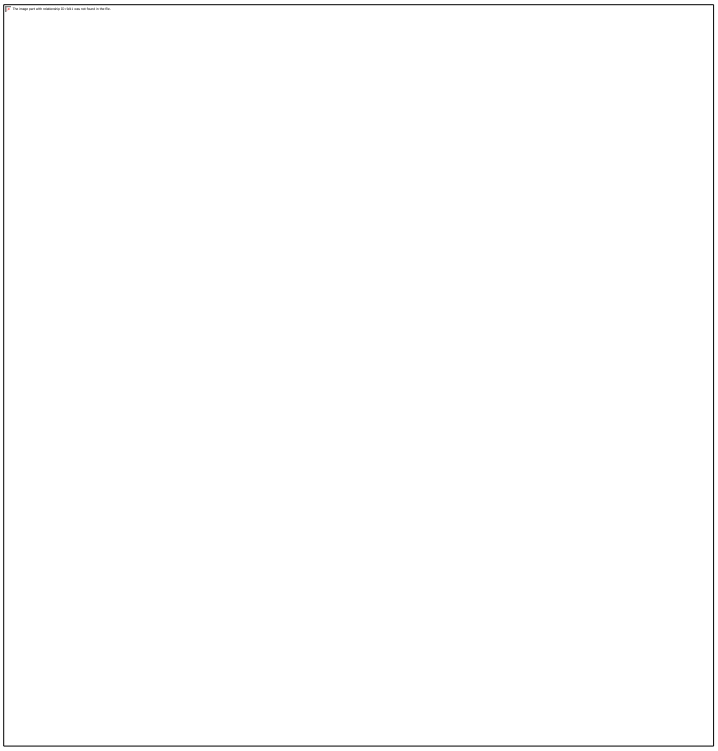

Fig. 3. Domain Determination

### *G. Capability Level Measurement*

At this stage, the capability level measurement process is carried out. The measurement is done by calculating the value of the respondent's answers to the questionnaire statements filled in from each subdomain as the current value. Meanwhile, the expected value is the maximum target value. The results of the calculation of the capability level values are as in Table VI.

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TABLE VI
CAPABILITY LEVEL VALUE CALCULATION RESULTS

| Subdomains | Governance Activities | Current Value | Target |
|---|---|---|---|
| BAI08.01 | Identify and classify internal and external information sources required for IT governance | 2.00 | 4 |
| BAI08.02 | Contextualize information into useful knowledge. Publish knowledge so that it can be accessed by stakeholders based on role criteria and access mechanisms | 3.00 | 4 |
| BAI08.03 | Knowledge transfer. Disseminate available data and information to stakeholders and communicate how these resources can be used to meet needs such as problem solving, learning, strategic planning and decision making. | 2.00 | 4 |
| BAI08.04 | Evaluate the usefulness, current relevance and value of knowledge elements. Update or retire outdated information. Identify information that still has value to the institution and store or archive it according to policy. | 2.00 | 4 |
| | Average Results | 2.25 | 4 |

After getting the current value results for each subdomain in BAI08, these values are added up and divided by the number of subdomains in BAI08-Manage Knowledge, namely four, and obtain the average value of the resulting four sud domains, which is 2.25. If rounded up to level 2, the overall maximum target value expected to be achieved is 5 in all BAI08 subdomains.

The analysis process for selecting the BAI08 domain as the main focus of this research was based on its direct relevance to the strategic goals and mission of the XYZ Institute. Effective knowledge management supports complex academic and administrative activities in higher education institutions. Focusing on these domains helps improve operational efficiency and encourages innovation, collaboration and learning among staff and students.

### *H. Gap Analysis*

The next step is the gap analysis stage, which subtracts the absolute value from the expected target, thereby finding the gap value for each BAI08 subdomain in Table VII.

TABLE VII
COMPARISON OF THE RESULTING VALUE WITH THE EXPECTED VALUE

| Subdomains | Governance Activities | Current Value | Target | Gap |
|---|---|---|---|---|
| BAI08.01 | Identify and classify internal and external information sources required for IT governance | 2.00 | 4 | 2 |
| BAI08.02 | Contextualize information into useful knowledge. Publish knowledge so that it can be accessed by stakeholders based on role criteria and access mechanisms | 3.00 | 4 | 1 |
| BAI08.03 | Knowledge transfer. Disseminate available data and information to stakeholders and communicate how these resources can be used to meet needs such as problem-solving, learning, strategic planning, and decision-making | 2.00 | 4 | 2 |
| BAI08.04 | Evaluate the usefulness, current relevance, and value of knowledge elements. Update or retire outdated information. Identify information that still has value to the institution and store or archive it according to policy | 2.00 | 4 | 2 |
| | Average Results | 2.25 | 4 | |

The gap results shown in Table VII with the distribution of capability level values for the IT governance process in institutions have capability values around level 2. Previously, no analysis or evaluation of the governance mechanisms at XYZ has been carried out. These findings are the beginning of the evaluation process so that it will be more organized. Identifying the gap between the actual conditions in IT management and the expected standards or best practices regulated by COBIT 2019 is essential for formulating a clear action plan to increase IT governance capabilities at XYZ Institute. This analysis highlights areas for improvement and guides strategic planning and future development so that the institution can achieve a higher level of maturity in overall IT and knowledge management.

Measuring capability levels in the BAI08 domain involves evaluating existing controls and processes and calculating actual and target values for each relevant subdomain. Data was collected through observation, interviews, and questionnaires and then analyzed to assess the extent of implementation and effectiveness of each knowledge management process at the XYZ Institute. The results of this evaluation reflect the level of institutional readiness in managing knowledge well and provide a basis for recommendations for appropriate improvements.

*I. Recommendation*

Based on the capability level measurement results obtained, researchers can recommend Institut XYZ to overcome gaps in the BAI08 domain per the 2019 COBIT guidelines:

1) *Implement standardized technology*
   Management so that regular evaluations can be carried out to improve academic services comprehensively.
2) *Evaluate IT governance*
   Gradually evaluate IT governance and measure capability levels to the next capability level.
3) *The measurements*
   The measurements can define the value proposition according to the target knowledge objectives and internal business relevance.
4) *The resulting governance document*
   The resulting governance document represents the current knowledge model according to taxonomy standards.
5) *Specification*
   Apart from that, specifications regarding institutional standards and policies regarding data and information need to be proposed, and institutions need to follow new technological developments in academic administration operations.
6) *Internal controls*
   Internal controls to ensure the quality of data and information is safe, stored and accessed (privacy requirements).
7) *Work method*
   The institutional document is documented digitally to speed up the academic service process.
8) *Workload*
   The number of human resources is small, while the number of service users is increasing, so good governance is needed to help process academic services on time.
9) *An IT architectural strategic plan needs to be created*
   Plan (blueprint master plan), build, implement, evaluate (assessment, IT audit).
10) *IT applications*
    IT applications must prioritize efficiency (paperless), ease of use (easy and simple), data integration into the system (centralized data), and data sharing via web service.
11) *Cultivate*
    Cultivate teamwork, be flexible and communicative.
12) *Transfer knowledge*
    Transfer knowledge between staff and plan educational training to develop skills and expertise in improving institutional performance.

With the recommendations provided by the researchers, it is hoped that the business processes and governance at the Institut XYZ will run better by the established strategies. The recommendations prepared in this research aim to address gaps in IT governance at the XYZ Institute. Developing new policies or improving IT infrastructure is hoped to optimize knowledge management and increase collaboration between departments. Implementing these recommendations is expected to support the institution's long-term strategic goals of improving academic and administrative services and ensuring more efficient use of human resources and technology.

These recommendations also have significant practical implications for policy development, strategic planning, and human resources and technology management at the XYZ Institute. By implementing these recommendations, institutions are expected to be able to optimize their academic and administrative services, increase overall operational efficiency, and strengthen their competitive position in the world of higher education.

## IV. CONCLUSION

Based on the results of the analysis and evaluation of information technology governance using COBIT 2019, the value obtained from measuring the capability level reached level 2. The results found in this research indicate that information technology governance in Institut XYZ is at an early stage because no previous evaluation has been carried out using standardization. Whatever. The proposed recommendations become a reference for improving IT governance business processes in institutions. Implementation of BAI08-based recommendations can support operational information technology governance.

Further research can implement recommendations according to the evaluation results to align with the

institution's vision, mission, and goals so that it can meet the target value of more than 2.25 as a continuation of this stage to develop the IT governance process. For future research, it is recommended to use other domains so that the results of the capability level assessment can be compared. Using the design factors in COBIT 2019 as a guide for designing governance and preparing recommendations for evaluating information technology governance in higher education.

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