ANALYSIS OF UNIVERSITY HELPDESK INFORMATION TECHNOLOGY GOVERNANCE USING COBIT 2019 AND FUZZY-AHP

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ABSTRACT

University Helpdesk as an information system service provider provided by PTIPD University assists students, staff, and lecturers in solving problems using information systems and networks, as well as updating information online and offline. Based on the Regulation Minister of Religion of the Republic of Indonesia Number 17 of 2013 to improve the quality of university delivery and services, and GUG (Good University Governance) implementation, governance framework is needed to align the vision, mission, and objectives. IT governance framework covering management, operational, maintenance, monitoring, and evaluation processes. The analysis of IT governance with COBIT 2019 resulted in the preparation of recommendations based on the mapping of the domain (area) of the 2019 COBIT design factors. These recommendations are needed for an analysis of the maturity level of PTIPD university helpdesk information technology governance. The research data were taken from annual reports and Key Performance Indicators, observations, and interviews. Based on Design Factors 1-11 to determine domain area, the result is needing improved governance perspective APO12-Managed Risk and DSS05-Managed Security Services. The focus area is risk management and service security management in terms of data and information. The expected ability level is at level 4, while the current ability level analysis is at level 2, the gap level analysis is 2 levels different. The result is to get 12 recommendations and 2 main recommendations using the Fuzzy-AHP method based on the weighting of the criteria of Regulation number 12 of 2012 the management of information technology in university.

Keywords: Analytic, IT Governance, Helpdesk University, COBIT 2019, and Fuzzy-AHP.

I.   INTRODUCTION

The development of Information Technology (IT) has greatly influenced improving the quality of education, especially in the learning process. IT is used as a learning medium, administrative records, and data processing. IT increases efficiency and effectiveness as well as user productivity, especially among the university academic community [1]. The use of IT in universities has a high investment so there needs to be significant, effective, efficient management, thereby reducing operational costs and increasing competitiveness [2].

Based on the Regulation of the Ministry of Religion of the Republic of Indonesia Number 54 of 2015, PTIPD (Information Technology and Data Base Center) is an Integrated Service Unit (UPT) that supports the implementation of education within UIN Walisongo Semarang. PTIPD is tasked with managing and developing management information systems, development, network and application maintenance, database management, technology, and network development. As a form of PTIPD service in the University environment, PTIPD provides a helpdesk system to be able to resolve user problems online and offline [3].

The PTIPD Helpdesk as a provider of information system services provided by the University's PTIPD unit helps students, employees, and teaching staff to overcome problems using information systems and networks, as well as obtain the latest information. In accordance with the Regulation of the Minister of Religion of the Republic of Indonesia Number 17 of 2013 to improve the quality of higher education implementation and services, PTIPD Walisongo State Islamic University (UIN) Semarang has become the Technical Implementation Unit (UPT) providing services for students, employees, and teaching staff to overcome barriers to use. IT, as well as the latest information sources. PTIPD provides various services, starting from helpdesk via WhatsApp, information and data services, server availability services, and supporting information system providers within the University environment. This service can be accessed both offline and online. Considering the importance of the helpdesk function and tasks, it is necessary to have parameters that can measure the level of IT governance (Information Technology) and IT Management capabilities so that they become more optimal, effective, and efficient [4].

As an embodiment of the implementation of GUG (Good University Governance), an IT governance framework is needed that emphasizes the system implemented by the university to achieve goals, manage the institution, and monitor the results obtained. [19]. According to the Minister of KOMINFO regulation No. 41 of 2007, concerning guidelines for national information and communication technology governance, the University needs an IT governance framework that can provide measures, indicators, and best practices to help PTIPD optimally manage and control services in accordance with the University's needs. The need for an IT framework that includes governance processes from planning, management, operations, maintenance, monitoring, and evaluation [5].

The COBIT 2019 IT governance framework is considered more flexible and open, which is more appropriate for small-scale agencies with minimal resources for implementing IT governance. This framework is also considered to be able to help agencies with the initial implementation of IT governance that considers aspects of internal and external resources, capabilities, competencies, services, infrastructure, and applications [6]. In addition, the IT governance framework provides measures, indicators, processes, and a collection of best practices to help the University optimally manage and develop appropriate IT management controls for the University [7]. The IT governance framework using Control Objectives for Information and Relate Technology (COBIT) 2019 was published by the Information System Audit and Control Association (ISACA) as the latest version of the COBIT framework series. COBIT 2019 focuses on the areas of planning, organization, acquisition, and implementation for effective service process management compared to other frameworks [1].

The results of the IT governance analysis with COBIT 2019 are recommendations given in accordance with the objects studied based on domain (area) mapping from the COBIT 2019 design factors. These recommendations are needed to improve service quality, but not all recommendations can be carried out simultaneously, there is a need for a ranking method in making decisions according to priorities. Fuzzy-AHP is a combination of the AHP method with the Fuzzy concept approach. Fuzzy-AHP is used to cover the weaknesses of the AHP method, namely problems with criteria that have a more subjective nature, uncertainty in numbers is represented by a scale sequence [17]. Based on the questionnaire used, the results of the weighting of these criteria are determined as a reference for priority selection of recommendations. Fuzzy-AHP is very suitable for use because this method can provide fuzzy weight values for predetermined criteria, which can minimize subjective assessments of the level of importance of criteria determined by decision makers. The aim of this research is to analyze the maturity level of information technology governance at the University's PTIPD Helpdesk using the COBIT 2019 framework and ranking the best recommendations using Fuzzy-AHP.

II. THEORY

A. IT GOVERNANCE

Governance is a combination of processes and structures implemented by the leadership and executives of an organization to inform, direct, manage and monitor organizational activities to achieve an organization's goals. Information technology (IT) is a study of design, implementation, development, support, or management of computer-based information systems, especially hardware and software. IT Governance is a form of planning in implementing and using IT used by a company so that it is in accordance with the vision, mission, and goals of the organization. [8].

There are several frameworks used for IT governance, each framework has different goals and implementation targets, IT governance management guides can help organizations face business challenges in the IT sector in accordance with applicable regulations, emerging risk management, and Align IT strategy with organizational goals [6]. Table 1 explains the different characteristics of the IT governance framework based on its objectives and implementation targets.

TABLE I COMPARISON OF IT GOVERNANCE FRAMEWORK

Framework	Objectives	Implementation
CMII	Provides guidance for the development process	System and application developer controllers
COSO	Improve organizational oversight in integrated systems	Leaders, management, users, and internal auditors
ISO 2000	Process management suite to deliver effective services	Management Level in the organization
TOGAF	Providing strategies to achieve goals by building enterprise architecture	The party responsible for EA Management (Enterprise Architecture)
COBIT	Provides IT governance guidelines for business management, IT risk, information security, and quality control	Internal Organizations, practitioners, and consultants

B. COBIT 2019

COBIT is a framework for governance and management of institution or company information and information technology. Governance is required in all technology and information processing that an institution implements to achieve the desired goals. Not only focused on the information technology department or anything related to that, but the entire organization and management within it. In addition, COBIT defines design factors that must be considered by agencies to build a system with the most appropriate governance. COBIT defines components for building and maintaining governance systems, processes, organizational structure, policies and procedures, information flows, culture and behavior skills and infrastructure [9].

Control Objectives for Information and Related Technology 2019 (COBIT 2019) is an Information System Audit and Control Association (ISACA) guide that discusses the latest IT governance and management. COBIT defines internal control as a policy, procedure, and practice and organizational structure designed to provide reasonable assurance that organizational objectives can be achieved, and undesirable events can be prevented or detected and corrected [9].

Unlike the previous version, COBIT 2019 has better flexibility when combined with certain frameworks. Companies/agencies' need for various frameworks makes the IT audit process more dynamic. COBIT 2019 has additional objectives, namely APO14 (Managed Data), BAI11 (Managed Projects), MEA04 (Managed Assurance). Apart from that, there is a COBIT 2019 Design Guide, namely the COBIT 2019 Design Toolkit [9].

The COBIT framework makes a clear distinction between governance and management. Governance ensures that stakeholder needs, conditions and preferences are evaluated to determine agreed and balanced institution goals. Direction is set through prioritization and decision making. Performance and compliance are monitored based on agreed direction and goals. Management plans, builds, runs, and monitors activities, in line with the directions set by governance, to achieve institution goals.

In implementing COBIT 2019, it is necessary to select a particular topic, domain (focus area) or problem for governance which is handled by the management. The aim of selecting this domain is to find out which parts influence governance. The selection of this domain can be determined using Design Factors, factors that influence IT governance and the success of IT implementation. There are 11 Design Factors used, consisting of strategy, objectives, risks, problems that often occur, threats that may occur, the role of IT in its implementation, resources, and size of the company/institution [10]. Design Factor in COBIT 2019 is in accordance with Figure 1.
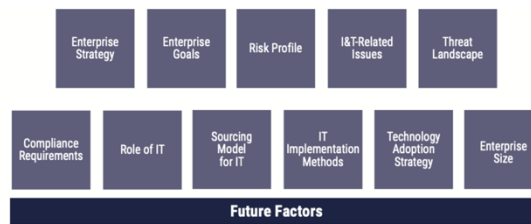

Figure 1. Design Factor COBIT 2019

C.   Helpdesk

The helpdesk is a functional unit responsible for handling various services related to information technology. Services can be provided via telephone calls, web interfaces, or infrastructure events that are automatically reported by a system [11]. Another term helpdesk is used to respond to handling problems reported by system users via telephone, email, website, fax or using a special system [12]. Other terms used for services using information systems and technology in an institution include helpdesk, Problem Tracking. Trouble Call, Technical Support & Services, Hotline Support, Call center, and so on. For uniformity of terms related to services using Information Technology, the term helpdesk is used [13].

Based on SKKNI (Standar Kompetensi Kerja Nasional Indonesia) Communication and Information Sector, the basic competencies possessed by the Helpdesk are [14]:

1. Can help with information technology service users' problems that are not listed in the available instruction manuals.
2. Can listen or read carefully the problems experienced by customers.
3. Have analytical skills, dig into details of obstacles through questions, so that you can diagnose the type of problem that exists.
4. Have good communication skills in communicating with customers.
5. Have basic technical skills in resolving software and hardware problems.
6. Have basic skills related to writing reports and applications in software and hardware.

The University Helpdesk provides several forms of services that can be utilized by the academic community at the University. Services available include managing information technology infrastructure (hardware, supporting software and network devices), managing applications/information systems on the user side, technical support in using applications/information systems if problems occur, handling if problems occur with applications/information systems via WhatsApp, email and telephone, and ensure that the quality of information system services is well maintained [15].

D.   PTIPD Universitas Islam Negeri (UIN) Walisongo

PTIPD is one of the Technical Implementation Units (UPT) at UIN Walisongo Semarang. In accordance with the Regulation of the Minister of Religion of the Republic of Indonesia Number 17 of 2013 concerning the Organization and Work Procedures of IAIN Walisongo, Article 71, it is stated that: PTIPD has the task of managing and developing information systems within the Institution, PTIPD is led by a Head appointed by the Chancellor, is under and responsible to the Vice Chancellor for General Administration, Planning and Finance [4]. To accelerate and optimize performance in 2013, the scope of duties and services of UPT PTIPD is divided into 3 divisions, they are:
1. Information Technology Infrastructure and Security,
2. Data and Information Systems Integration, and
3. Information Technology Services.

In 2015, the Regulation of the Minister of Religion of the Republic of Indonesia No. 54 of 2015 concerning the Organization and Work Procedures of UIN Walisongo Semarang, Article 81, stated that: PTIPD has the task of managing and developing management information systems, development, maintenance of networks and applications, database management,

development other technologies, and network cooperation. PTIPD is led by a Head who is responsible to the Deputy Chancellor for General Administration, Planning and Finance [3].

PTIPD has a vision, namely as a center for superior information technology-based data and information services. PTIPD has a mission, namely as follows:

1. Organizing information and communication technology technical services as a means of realizing the Tri Dharma of Higher Education
2. Manage integrated database systems and information systems.
3. Increasing organizational effectiveness and efficiency through automation-based services.

PTIPD's vision and mission are in line with the University's objectives as follows:

1. To produce graduates who have academic, professional, and ethical capacities who can apply and develop a unified body of knowledge.
2. Produce research work that is useful for the interests of Islam, science, and society.
3. Produce community service work that is useful for community development.
4. Realizing the internalization of local wisdom values in the Tridharma of higher education.
5. Obtain positive and productive results from collaboration with various institutions on a regional, national, and international scale.
6. The birth of professional higher education governance with international standards.

E. Information Technology Selection Principles

An important element that is the focus of higher education governance reform is a higher education system that defines goals, implements them, manages institutions, and monitors the achievement. Therefore, the principles of higher education governance are needed based on Law of the Republic of Indonesia Number 12 of 2012 in article 63 concerning higher education management. This principle is [16]:

1. Accountabilities

The ability and commitment to be accountable for all activities carried out in higher education must be carried out by all stakeholders in accordance with statutory provisions. Accountability can, among other things, be measured by the ratio between students and lecturers, the adequacy of facilities and infrastructure, the provision of quality education and graduation competency.

2. Transparency

Openness and ability of higher education institutions to present relevant information appropriately and accurately to stakeholders in accordance with statutory provisions.

3. Nonprofit

The principle of activities with the aim of not seeking profit, so that all results of activities are reused by universities in improving services and supporting education.

4. Quality assurance

Systemic activities to provide higher education services that meet or exceed national higher education standards, as well as improving the quality of education services on an ongoing basis.

5. Effectiveness and Efficiency

Systemic activities to utilize resources in the provision of higher education so that they are right on target and there is no waste.

F. Fuzzy Analytical Hierarchy Process (Fuzzy-AHP)

The Fuzzy-AHP method is a combination of the AHP method with a fuzzy logic concept approach, this approach was introduced by Chang in 1996. Fuzzy-AHP is an analysis method developed from traditional AHP. Fuzzy-AHP complements the shortcomings of traditional AHP, namely problems with criteria that have a more subjective nature. The difference between AHP and Fuzzy-AHP is the implementation of pairwise comparison weighting in a comparison matrix represented by three variables (*a, b, c*) or (*l, m, u*) wherever called *Triangular Fuzzy Number* (TFN) [17].

Each fuzzy triangular is symbolized by *l, m, u* each symbol has a value, according to a membership function that includes three sequential weights. TFN is *fuzzy* set, which is used for measurements related to human subjective judgment using linguistic language. TFN symbolized with *M*= (*l, m, u*), where *l* is *low*, *m* is *medium*, and *u* is *up (higher)*. The TFN approach used is usually quite simple, namely by fuzzifying the AHP scale into a Fuzzy-AHP scale [17].

The Fuzzy-AHP problem solving step begins with the AHP process and then continues by changing the AHP scale to a fuzzy triangular scale to obtain priorities. The AHP and TFN processes are as follows [18]:

1. Hierarchy arrangement

The problem to be solved is broken down into elements of criteria and alternatives, then arranged into a hierarchical structure, so that it will make decision making easier to analyze and draw conclusions about the problem. The hierarchical structure is shown in Figure 2. Hierarchical structure between criteria and alternative choices.
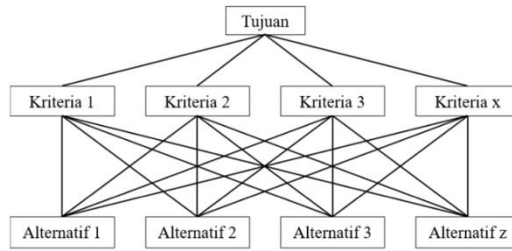
Figure 2. Hierarchical Structure

2. Determination of Matrix with TFN (*Triangular Fuzzy Number*) Scale

Determining the pairwise importance comparison matrix between criteria and the TFN scale is measured through pairwise comparisons. For various problems, a scale of 1 to 9 is the best scale for expressing opinions. The value and definition of quality opinion from the TFN comparison scale are shown in Table 2 regarding pairwise comparisons between the levels of importance of AHP and TFN.

TABLE 2 PAIRED COMPARISON SCALE

Level of importance AHP	Linguistic Set	TFN (*Triangular Fuzzy Number*)	Reciprocal
1	Just Equal	(1,1,1)	(1,1,1)
2	Intermediate	(1/2,1,3/2)	(2/3, 1, 2)
3	Moderately	(1, 3/2, 2)	(1/2, 2/3, 1)
4	Intermediate (One element is more important than the others)	(3/2, 2, 5/2)	(2/5, 1/2, 2/3)
5	Strongly Important	(2, 5/2, 3)	(1/3, 2/5, 1/2)
6	Intermediate (elements are more important than the others)	(5/2, 3, 7/2)	(2/7, 1/3, 2/5)
7	Very Strong elements	(3, 7/2, 4)	(1/4, 2/7, 1/3)
8	Intermediate (stronger than others elements)	(7/2, 4, 9/2)	(2/9, 1/4, 2/7)
9	Extremely Strong than others	(4, 9/2, 9/2)	(2/9, 2/9, 1/4)

3. Determine Fuzzy synthesis values (Si)

Determining the fuzzy synthesis value (Si) to obtain the relative weights for the decision elements (alternatives) to be taken. The following is the formula used to determine this value.

$$\tilde{S}i = \sum_{j=1}^{m} \widetilde{M}_{ci}^{j} \odot \left[\sum_{i=1}^{n} \sum_{j=1}^{m} \widetilde{M}_{ci}^{j} \right]^{-1} \tag{1}$$

Fuzzy synthesis values (Si) used to obtain the extent of an object, so that the extent analysis value M can be obtained which can be shown as M_{ci}^{n}, where i=1, 2, ..., n. Number j=1, 2, ..., m.! wherever partial matrix using addition operations on each fuzzy triangular number.

4. Calculation of comparison of fuzzy synthesis values (Si)

Calculation of membership degrees from comparison of fuzzy synthesis values to obtain vectors. The formula used is as follows:

$$V(M_2 \geq M_1) = \begin{cases} x & , jika\ m_2 \geq m_1 \\ 0 & , jika\ l_1 \geq u_2 \\ \frac{(l_1 - u_2)}{(m_2 - u_2) - (m_1 - l_1)}, & yang\ lainnya \end{cases} \tag{2}$$

This comparison is used for the weight value for each criterion. For two numbers *triangular fuzzy* $M_1 = (l_1, m_1, u_1)$ dan $M_2 = (l_2, m_2, u_2)$ with probability level $M_2 \geq M_1$.

5. Normalization of vector weights

Normalization of vector weights or priority values that have been obtained. After normalizing the vector weights, the vector obtained is no longer a fuzzy number so that decision making continues with the AHP method.

(3)

$$W' = \big(d'(A_1), d'(A_2), \dots d'(A_n)\big)t$$

$\overline{A_i}$(i = 1,2, ... n) is n element and d' $(\overline{A_1})$ is a value that describes the relative choice of each decision attribute. The weight vector is carried out to facilitate interpretation. This weight normalization will be carried out so that the values in the weight vector are allowed to be analog weights and consist of non-fuzzy numbers.

6. Vector weight ranking

Ranking the vector weights with alternative choices, the total ranking is obtained by multiplying the evaluation vector of each aid recipient with the priority vector.

7. Decision Making

Decision making (alternative) by selecting the total ranking with the highest value.

III. RESEARCH METHODS

A. Research Materials and Tools

The research uses research materials in the form of subjective data through observations and interviews of the unit head and two PTIPD University Helpdesk employees. Annual report and Key Performance Indicators. The research tool used is the COBIT 2019 design factor, with the result in the form of recommendations which will be reprocessed using Fuzzy-AHP.

B. Research Methods

This research procedure begins with data collection through literature study and institution documentation study and problem identification, followed by determining the domain using COBIT 2019 design factors. Then continues with collecting research data in agencies through observation, questionnaires, and interviews. Next, analyze the gap from the analysis of the current level of capability and the expected level of capability. The research procedure is presented in Figure 3
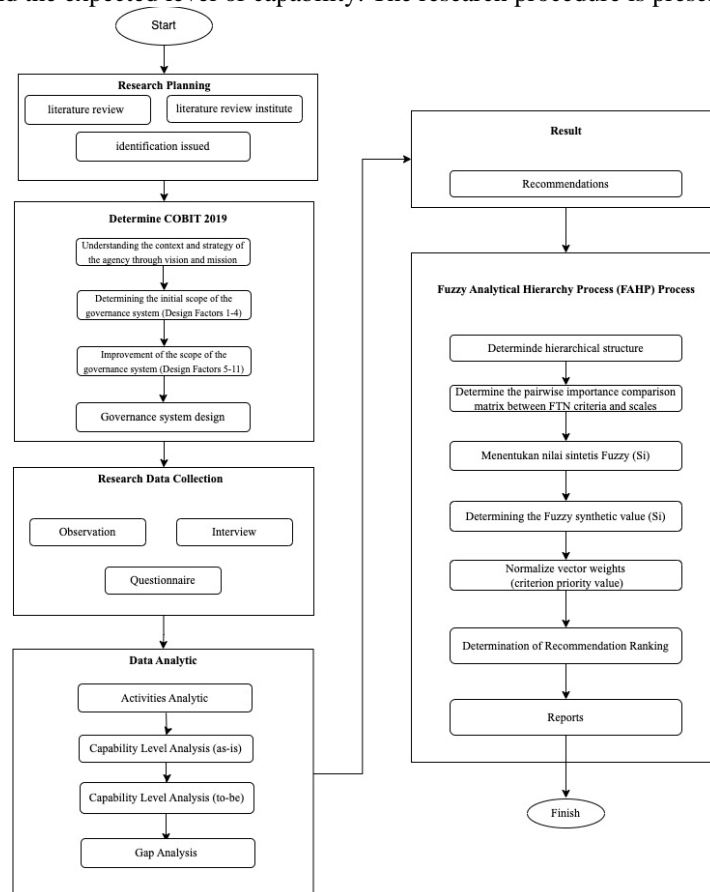

Fig 3. Research Methods

1. Research Planning

At this stage, research planning is carried out by conducting literature studies from journals and previous research as well as studying documents from the PTIPD University institution. Literature study was carried out to obtain basic supporting theories and strengthen references for identifying problems in research. This institution document study was carried out to identify problems and initial analysis of governance. This institution document is related to the institution 's profile, vision, mission and objectives, organizational structure and types of services that will be conducted research.

2. Determine *Domain* COBIT 2019

The beginning of determining the domain using the COBIT 2019 framework is understanding the context and strategy of the institution through the existing vision and mission. Mapping uses the COBIT2 2019 toolkit called design factor. Then determine the initial scope of the governance system with design factors 1-4 and improve the scope of the governance system with design factors 5-11. The result at this stage is the design of a governance system that can be implemented in the institution.

3. Collecting Data

After the domain determination stage, data collection is carried out through direct observation at the University PTIPD, then interviews with the University PTIPD and distribution of questionnaires to respondents and collection of data results from respondents.

4. Data Analytic

The analysis stage is carried out on the data that has been collected and provides the results to the University PTIPD Helpdesk. The data analysis stage starts from analyzing the activities of the University's PTIPD Helpdesk using the Guttman Scale. Then proceed with capability analysis (as-is) and capability analysis (to-be), and finally continue with gap analysis. After the gap analysis is obtained from the difference between capability (as-is) and capability (to-be).

5. Result Analysis

All data analyzed using COBIT 2019 will produce recommendations that can be implemented by agencies for improvement. These recommendations are suggestions and input for improving the information technology governance of the University's PTIPD Helpdesk.

6. Processing *Fuzzy-Analytical Hierarchy Process* (F-AHP)

This stage is the stage for searching for priority recommendations to find out which recommendations need to be carried out first. At this stage, a hierarchical structure is first determined to determine priority recommendations, then determine the importance comparison matrix. This matrix pairs criteria with the Triangular Fuzzy Number (TFN) scale.

Determine the fuzzy synthesis value (Si) to obtain relative weights for the elements for making priority recommendations. Next, calculate the degree of membership from the comparison of the Si values for the vector, where the weight of the vector and the priority value of the criteria will be normalized. Determining the recommendation ranking is obtained by multiplying the evaluation vector for each criterion by the priority vector. The result is priority recommendations selected from the specified criteria.

7. Report

This stage is the final stage of the research, namely preparing the report and collecting all the results of the research data that has been carried out. This stage of the research reaches conclusions and suggestions.

IV. ANALYSIS AND RESULT

The identification carried out is a measurement of the information technology governance performance of the University's PTIPD helpdesk. At this stage, the vision and mission of PTIPD University will be determined, namely Enterprise Goals, Alignment Goals, and Governance Management Objective (GMO). Aims to obtain the needs of policy makers according to the institution 's vision and mission as shown in Table 3.

TABLE 3. IDENTIFICATION OF ENTERPRISE GOALS

No	Vision and Mission	Reference	Enterprise Goal	Balanced Scorecard (BSC)
1.	Become a center for superior information technology-based data and information services	EG10	Staff skills, motivation, and productivity	Internal
2.	Provider of information and communication technology technical services based on the Tri Dharma of Higher Education	EG11	Compliance with internal policies	Internal
3.	Management of integrated database systems and information systems	EG13	Product and Business Innovation	Growth
4.	Increasing organizational effectiveness and efficiency through automation-based services	EG12	Managed digital transformation programs	Growth

Based on the results of mapping the identification of Enterprise Goals based on the vision and mission of PTIPD University with BSC according to COBIT 2019, we obtained the identification of Enterprise Goals which is shown in table 4.

TABLE 4. IDENTIFICATION OF ENTERPRISE GOALS

Reference	*Enterprise Goals*
EG10	Staff skills, motivation, and productivity
EG11	Compliance with internal policies
EG12	Managed digital transformation programs
EG13	Product and Business Innovation

Identification of Alignment Goals by mapping from table Enterprise Goals and BSC, the result shown by in pada table 5.

TABLE 5. IDENTIFICATION OF ENTERPRISE GOALS AND ALINGMENT GOALS

BSC	Reference	Enterprise Goal	Alignment Goals
Internal	EG10	Staff skills, motivation, and productivity	AG12 (competent and motivated staff with mutual understanding of technology and business)
Internal	EG11	Compliance with internal policies	AG11(I&T compliance with internal policies)
Growth	EG13	Product and Business Innovation	AG13 (knowledge, expertise, and initiatives for business innovation)
Growth	EG12	Managed digital transformation programs	AG03 (Realized benefits from I&T-enabled investments and services portfolio)
			AG08 (enabling supporting business process by integrating applications and technology)
			AG09 (delivery programs on time on budget and meeting requirements and quality standards)

Next is the analysis in determining the domain and objectivity with Design Factor (1-11) resulting in domains with a value of >75, namely APO12 – Managed Risk and DSS05 – Managed Security Services.

Next is data analysis related to the management of institution helpdesk information technology with the objective domains APO12 and DSS05 Services which support the success of the institution's vision and mission. Evaluation and recommendations provided by improving the management of the University's helpdesk information technology to increase the Current Capability Level (as-is).

TABLE 6. ANALYSIS AND IDENTIFICATION RESULTS

Objectives	Analytic Result	Recommendations
APO12-*Managed Risk*	a. The institution already has records related to risk events that are currently occurring or that have already occurred, but these records are still not organized in a regular manner. b. The list of existing risks includes problems with using the information system, data entry errors, network and infrastructure availability, server equipment down and not working properly. c. The institution already has several SOPs related to risk management, but there has been no further analysis regarding risk management based on the framework. d. The institute has documentation related to the risk profile, but it is only related to infrastructure, not related to system service information technology. e. To reduce the level of risk that occurs in helpdesk services, the institution has provided services via online WhatsApp messages. Reporting of problems that occur is immediately recorded even though it is not systematic, handling is still personal and slow. f. Risk mitigation business processes in agencies are still not defined and structured according to applicable policies.	a. Procurement of a recording system that includes the design, implementation, maintenance, and policy processes in managing information security and risk data. b. Creating documentation related to risk reduction efforts, such as IT risk profiles, governance assessments related to IT risks. c. An internal audit program is carried out regularly to monitor and increase the effectiveness of risk management procedures. d. Creation of risk profiles related to network infrastructure and information systems. e. Increasing HR skills through training and the latest systems f. Creation of a risk mitigation information system in accordance with the implemented IT governance framework
DSS05-*Managed Security Services*	a. There is no further management that handles planning, maintenance, management related to data security governance and daily operational services. b. There is no routine activity policy from the institution for monitoring and evaluating data and information security management. c. There is no documentation on maintenance, handling and prevention of malware that causes server downtime.	a. Management of budgets, schedules, and dependencies of several daily operational services. b. Determination of routine activity policies related to monitoring and evaluation of data and information security management to support strategic planning and IT targets. c. Procurement of the latest server maintenance system d. Prevention of information and data security threats that are managed by appointing dedicated human resources.

d. The applicable policies and SOPs are still practical solutions.
e. Resources from internal and external parties are limited.
f. The socialization of several new systems has been carried out by the institute, but it has not been used massively and optimally

e. Risk management innovations based on budgets that comply with the latest policies.
f. Updated information and data service systems that can be accessed openly

V. CONCLUSION

Analysis of information technology governance at the PTIPD UIN Walisongo Semarang helpdesk using COBIT 2019 with design factors 1-11 in determining domains with a value of > 75, namely APO12 – Managed Risk and DSS05 – Managed Security Services. For Current Capability (as-is) it shows it is at level 2. Then for the results of the Expected Capability Level (to-be) it shows it at level 4. The Gap Level is 2 level.

Based on the implementation of COBIT 2019 in information technology governance at the PTIPD UIN Walisongo Semarang helpdesk, 12 recommendations were obtained. Using the scale to determine priority recommendations resulted in the highest recommendation being to create and maintain a portfolio of IT investment programs, IT services and IT assets, to form the basis of the current IT budget and support strategic planning and IT goals. The recommendation with the lowest score is Prevention of information and data security threats which are managed by appointing dedicated human resources.

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