Jurnal Sistem Informasi Bisnis 02(2024)
Copyright ©2024, JSINBIS, p-ISSN: 2502-2377, e-ISSN: 2088-3587
On-line: http://ejournal.undip.ac.id/index.php/jsinbis/article/view/59368

IT Governance Design in XY University using COBIT 2019 Framework

Willson Mangoki*, Danny Manongga, Ade Iriani

Faculty of Information Technology, Satya Wacana Christian University, Indonesia

Submitted: January 5th, 2024; Accepted: March 3rd, 2024
DOI:10.21456/vol14iss2pp111-122

Abstract

The management and control of information and technology at the university were required for IT's finest use, but in line with organization goals, they can be realized with the use of IT governance. This research uses a qualitative approach with techniques such as interviews, observation, expert judgment, and literature studies that are relevant to the concept of IT governance with the COBIT framework and its application in various fields. This research presents an IT governance design that is considered suitable to be applied at XY University using COBIT 2019 Framework. 10 design factors and 40 IT processes listed in COBIT 2019 are used as parameters. The results obtained from four processes with scores ranging from 50 to 100 with capability levels 3 and 4, namely APO04-Managed Innovation, APO03-Managed Enterprise Architecture, APO07-Managed Human Resources, and BAI07-Managed IT Change Acceptance and Transitioning, are translated into recommendations for actions that need to be taken in implementing IT governance.

Keywords: IT Governance; University; COBIT 2019

1. Introduction

Currently, information technology plays an important role in educational institutions such as universities. In order to optimize IT in the field of education, the Ministry of Research, Technology, and Higher Education, through Permenristekdikti No. 62 of 2017, stipulates regulations on information technology governance covering the scope of higher education (Permenristekdikti No 62 Tahun 2017, n.d.), as a guideline for the implementation of good governance through e-government for each organizational unit so that the use of IT, which covers planning, spending, and investment management, realization, operation, and system management, is carried out within an accountability framework. XY University makes IT a part of services in the field of education, as stated in the Master Plan for System Development and Information Technology (Ripsti) 2020–2025. Furthermore, XY University's 2020–2025 Strategic Plan (Renstra) determines the focus for the current management period, one of which is on improving governance at the university level and faculty level.

As of currently, XY University's use of IT has only focused on administration and lectures, while other processes have not been implemented and/or are in the process of being digitized to use information systems (Gallaran et al., 2022). In the observations made, no governance standards or set of regulations related to the use of IT have been found. The current IT development at XY University in terms of the Ministry of Research, Technology, and Higher Education regulations needs to be organized in a framework in the form of governance in the use of technology and information, which is then called IT governance (Salegar and Rizal, 2020). IT governance includes identifying, establishing, and linking mechanisms within IT to manage risks while at the same time ensuring system performance in line with the goals that the organization wants to achieve (Saputra and Redo, 2021; Asterinadewi and Handoko, 2018). Building IT in an organization is certainly expected to provide value that is useful for the institution, considering the investment made (Lompoliu et al., 2022). Many frameworks have been developed to assist in implementing IT governance, one of which is COBIT 2019 (Harits et al., 2022). COBIT 2019 regulates IT governance by focusing on organizational needs and a series of design factors by adjusting and prioritizing governance system components to suit the characteristics of the institution (Wabang et al., 2021).

This study uses a qualitative approach to data collecting, which is done by interviewing people who have knowledge of the research topic and by looking at the case study. While observations were made by closely observing the business processes taking place in the organization as well as documents related to the research topic in the case study, interviews were also

*) Corresponding author: willson.mangoki@gmail.com

Copyright ©2024, JSINBIS, p-ISSN: 2502-2377, e-ISSN: 2088-3587
On-line: http://ejournal.undip.ac.id/index.php/jsinbis/article/view/59368

conducted to ascertain the perspectives of stakeholders regarding the current and future conditions, goals, and strategies of XY University.

The COBIT framework's use in the academic sector is covered in research by Murad et al. (2018). They applied COBIT for their research, concentrating on the EDM (Evaluate, Direct, and Monitor) domain. The decision to choose this domain is based on the requirements, circumstances, and stakeholder choices so that current IT can function in line with organizational objectives. In this study, several procedures, including conducting interviews, establishing roles, and assessing the level of capability, produced an analysis of the organizational capability and suggestions for improving the IT management process.

Similar research was also conducted by Gunawan et al., (2018) and Alonso et al., (2020), by using COBIT as an IT governance framework in higher education institutions. The results of this study take the form of IT governance system suggestions, capacity evaluations, and references to the COBIT 5 EDM domain.

Research on IT governance with the COBIT 2019 framework by Wabang et al., (2021) to analyze IT governance related to academic services in the research object. Enterprise goals are set as design factors then the analysis is carried out by measuring the maturity level of IT management with the COBIT 2019 standard to identify the current state of IT governance, as well as analyzing the gaps that occur to improve IT governance and formulating recommendations for improvements to IT governance and management to achieve organizational goals or the expected level of maturity.

This study uses the University's Strategic Plan and IT Development Plan which shows the University's actual issues and priorities, as a measure for designing a more accurate IT Governance model. In contrast to prior studies that centered on a single domain, this study offers a novel approach based on the COBIT 2019 design tools and applied COBIT 2019 domains tailored to university issues, rather than just focusing on the needs of a particular division. Therefore, this study aims to present an IT governance design that is suitable to be applied at XY University by using COBIT 2019 framework.

2. Literature Review

2.1. Governance

Governance is a system and process to ensure accountability and transparency in an organization (Wabang et al., 2021).Therefore, IT governance is defined as the authority and responsibility to determine decisions that encourage the behavior of technology and information utilization in organizations (Murad et al., 2018). Furthermore, IT governance can be interpreted as an instrument to control resources related to technology and information to support the goals and strategies of the organization (Samsinar and Sinaga, 2022).

2.2. COBIT

COBIT (Control Objectives for Information and Related Technology) is a framework for the governance and management of information and technology aimed at all companies developed by ISACA (Information System and Control Association) (Bernika and Nuryana 2021; Haster and Hartomo, 2022). IT in the company is all technological and information processing carried out by the company to achieve goals, regardless of the unit that carries out the process (Saleh et al., 2021). In other words, IT in an organization is not limited to the IT department of the organization (ISACA, 2018b). COBIT 2019 distinguishes between governance and management. These two disciplines cover different activities, require different organizational structures, and are for different purposes. COBIT defines the components for building and maintaining a governance system in the form of processes, organizational structure, policies and procedures, information flow, culture and behavior, and skills in leading the organization (Fadhilah et al., 2021).

2.3. COBIT 2019

COBIT 2019 has a framework covering five domains in the governance area to ensure that the needs, circumstances, and choices of stakeholders are interpreted to determine balanced and agreed-upon corporate goals (Sipayung et al., 2022), determine the direction of the company by prioritizing and making decisions, and also monitoring performance, and adherence to agreed-upon directions and goals specifically for the EDM domain (Audia and Sugiantoro, 2022). In the management area, it is the planning, construction, implementation, and monitoring of activities in line with the direction set in the governance section to achieve company goals. This area consists of the APO (Align, Plan, and Organize), BAI (Build, Acquire, and Implement), DSS (Deliver, Service, and Support), and MEA (Monitor, Evaluate, and Assess) domains (Legowo and Christian, 2019; Yasin et al., 2020). The application of the COBIT 2019 framework differs from one company to another because, in practice, the application of COBIT 2019 is highly dependent on the characteristics and needs of each company, so governance guidelines in one company cannot be the standard for governance guidelines in other companies. The overall governance and management areas and their domains are shown in Figure 1.

Copyright ©2024, JSINBIS, p-ISSN: 2502-2377, e-ISSN: 2088-3587
On-line: http://ejournal.undip.ac.id/index.php/jsinbis/article/view/59368

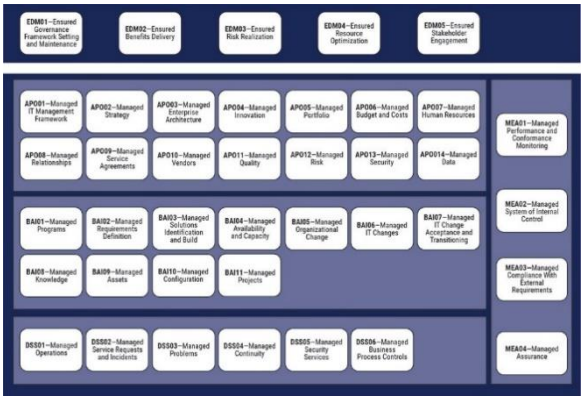

Figure 1. COBIT 2019 Core model

2.4. Capability Level

The capability level is measured by how well a process is implemented and executed. The process refers to the activities contained in the governance and management objectives (ISACA, 2018a). A process reaches a set capability level if all activities at that level are successfully fulfilled. The scale used is 0 to 5 (Saridewi et al., 2018). In more detail, the scale at the capability level can be seen in Figure 2.

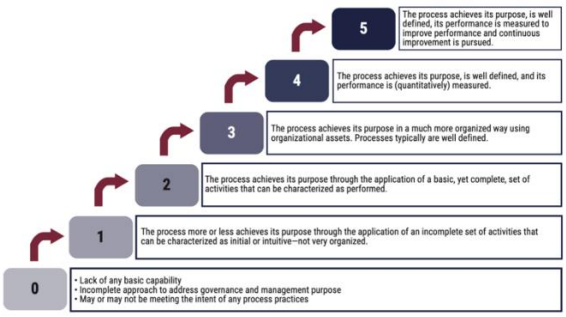

Figure 2. Capability Level

3. Method

This research uses a qualitative descriptive method. This method is carried out by collecting data first, then clarifying, analyzing, and interpreting it to obtain a clearer picture of the research object (Riadi et al., 2018). The initial stage in this research is data collection by document observation (Safitri et al., 2021). The documents examined were the Strategic Plan and Ripsti 2020–2025 of XY University, obtained from the research site stakeholders. The document contains, among others, the mission, vision, and university's strategy to develop quality over a 5-year period. In addition to observations on documents, observations were made on existing business processes at the case study site to understand the process flow in a more structured manner, coupled with literature studies from relevant research. After all the necessary data is collected, an initial analysis is carried out by looking at the mission, vision, and strategy, which are then translated into business objectives, IT objectives, and IT processes using the COBIT 2019 framework (Lestari et al., 2022). The next stage of identifying findings involves using the expert judgment method to obtain a more accurate assessment. Recommendations are made from the findings for the IT governance process. In the final stage of the analysis process, the design factor is obtained (Nurcahya et al., 2022) which correlates with IT governance in the case study and becomes an IT governance design that is hopefully compatible with the existing conditions to be achieved by XY University (Anastasia and Atrinawati, 2020). The detailed research stages are shown in Figure 3.

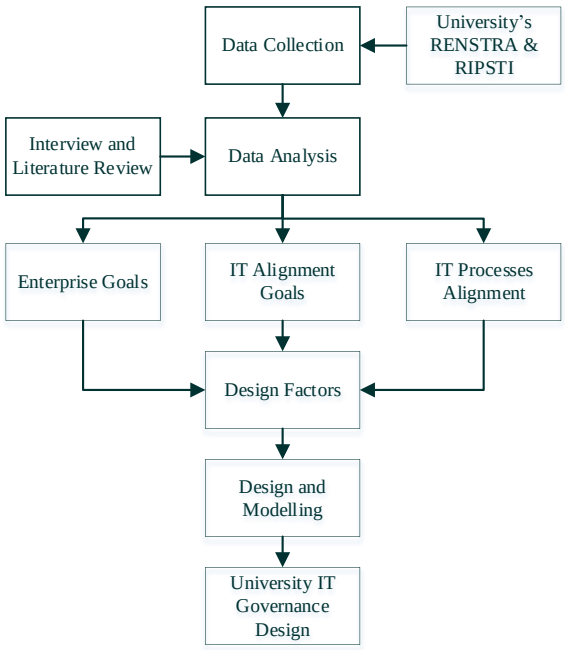

Figure 3. Research Stages

The explanation of the research stages based on Figure 3 above is as follows:

1) Alignment of Enterprise goals, IT Goals, and IT processes

   The 2019 COBIT framework's IT governance design requirements provide the foundation for this stage. Understanding the enterprise strategy, enterprise goals, risk profile, and IT-related concerns is the key goal of this stage. To comprehend the organization's strategy, the purposed outcomes, and the actual status of IT in the organization, the vision, purpose, and organizational goals as described in the document and observe the business processes that are in operation must be examined.

2) Identify IT governance design factors

   Using the COBIT 2019 toolbox, this step serves to define the scope of the governance system design by taking into account Design Factors (DF) 1 through 10 (Tulus and Tanaamah, 2023). Enterprise strategy, enterprise goals, risk

Copyright ©2024, JSINBIS, p-ISSN: 2502-2377, e-ISSN: 2088-3587
On-line: http://ejournal.undip.ac.id/index.php/jsinbis/article/view/59368

profile, IT-related concerns, threat landscape, compliance standards, the function of IT, source model for IT, IT implementation techniques, and technology adoption strategy make up the design element. Additionally, it is decided which DF shall be applied as well as its value. The degree of governance and management objectives is the conclusion of this assessment.

3) IT governance design results

The IT governance system design is completed at this level using all the results from the preceding procedure. The procedures in question involve combining all the data from the earlier processes to conclude the DF. The governance that emerges must reflect the evaluation of each DF. This approach enables deriving conclusions in the form of an IT governance system design based on the phases of creating an IT governance system to create a recommendation to stakeholders at XY University.

4. Result and Discussion

4.1. Result

IT at XY University plays an important role in various aspects. From the interviews conducted, it was found that IT can support and develop campus performance and services. Seeing the development of technology to date, universities are trying to adapt to the use of information systems and technology, especially in academics and services related to the needs of the academic community. In this IT implementation, BAPSI plays a role as a party directly related to the development and implementation of IT within the scope of the campus. The information systems used today are not fully developed internally, but some are distributed by the Directorate of Higher Education (Dikti) and by vendors.

The existing IT resources at the university are centered on the services of the Academic Administration Bureau and lectures. As for further development plans, it is expected that the information system under development can fulfill the needs of all fields. The focus on the availability of this service will be categorized into three systems that integrate three fields: admissions, finance, and academics. The three bureaus will be synchronized through an integrated line to create a digital-based campus. User adaptation to the new information system requires an educational process so that all elements involved can familiarize themselves with the changes in business processes that occur. Therefore, to understand the purpose and value of implementing IT as a whole, IT governance goes through the following:

1) Mapping COBIT 2019 Domains

The initial stage before designing IT governance at XY University is to map the domains contained in the 2019 COBIT framework and select the domain to be analyzed using the Goals Cascade method as shown in Figure 4.

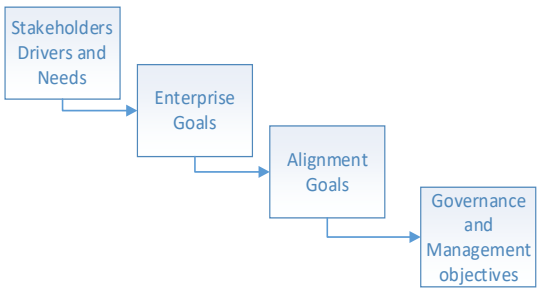

Figure 4. COBIT 2019 Framework Goals Cascade

The Goals Cascade in Figure 4 shows how the process of identifying stakeholder needs derived into agency business goals (enterprise goals) and IT implementation goals (alignment goals), which result in IT governance and management objectives. Based on this process, an IT governance design is implemented at XY University using the steps contained in the Design Factors (DF) COBIT 2019.

2) DF 1: Enterprise Strategy

Each institution has its strategy in the strategic development plan. As in COBIT 2019, this development plan is categorized into four types according to the focus of the goals set, namely where the company or agency focuses on growth and development (growth/acquisition), focuses on providing something new in terms of goods and services (innovation/differentiation), focuses on minimizing the use of finance in the long run (cost leadership) and focuses on providing reliable services (client service/stability). The analysis of the XY University strategy based on the Strategic Plan and RIPSTI is as shown in Table 1.

Table 1. XY University Strategy

Value	Importance (1-5)
Growth/acquisition	5
Innovation/Differentiation	4
Cost Leadership	1
Client Service/Stability	2

Table 1. above shows that XY University has a strategy that focuses on growth/acquisition compared to innovation. This is because universities are entities in the field of education that always process and adjust to the current development of science and technology.

3) DF 2: Alignment of Enterprise Goals to Alignment Goals

The next stage is DF 2, namely Alignment of Enterprise Goals to Alignment Goals, which aims to align institutional goals with IT goals. The purpose of XY University in higher education in Indonesia is to create human resources who have God-fearing characters, academic abilities, and creative abilities, develop and apply science,

Copyright ©2024, JSINBIS, p-ISSN: 2502-2377, e-ISSN: 2088-3587
On-line: http://ejournal.undip.ac.id/index.php/jsinbis/article/view/59368

technology, and art, disseminate science, technology, and art for the benefit of the community's life and national culture, and create higher education and higher education management through best educational practices. The business objectives in the 2019 COBIT Framework Balanced Scorecard (BSC) selected based on information contained in the Strategic Plan and RIPSTI in the form of strategies and priorities in areas at the university level and the number of budgeted funds. Direct field observations were carried out to find out and verify the ongoing conditions of the business processes. In the end, interviews were conducted with the heads of academic administration, finance, human resources, the quality assurance agency, and the information system development section so that the determination of enterprise goals was more accurate (EG01, EG04, EG05, EG06, EG07, EG08, EG10, EG12, and EG13).

Table 2. Enterprise Goals (EG) Universitas XY

No.	Enterprise Goals	BSC	Relationship
EG01	Portfolio of competitive products and services	Financial	Primary
EG04	Quality of financial information	Financial	Secondary
EG05	Customer-oriented service culture	Customer	Secondary
EG06	Business service continuity and availability	Customer	Primary
EG07	Quality of management information	Customer	Primary
EG10	Staff skills, motivation and productivity	Internal	Primary
EG12	Managed digital transformation programs	Growth	Primary
EG13	Product and business innovations	Growth	Primary

The mapping of business objectives into the corresponding IT objectives is done by mapping EG and Alignment Goals (AG). The IT goal to be achieved by XY University is the integration of information within the university environment. Mapping of IT goals is carried out with 13 perspectives of IT goals in 4 dimensions in BSC, namely customers, financial, internal, and growth, contained in the 2019 COBIT framework obtained Alignment Goals (AG03, AG04, AG05, AG06, AG07, AG08, AG09, AG10, AG12, and AG13) as shown in Table 3.

Table 3. Enterprise Goals (EG) to Alignment Goals (AG)

No.	Alignment Goals	Relation
AG03	Realized benefits from IT-enabled investments and services portfolio	Secondary
AG04	Quality of technology related financial information	Primary
AG05	Delivery of IT services in line with business requirements	Secondary
AG06	Agility to turn business requirements into operational solutions	Secondary
AG07	Security of information, processing infrastructure and applications	Secondary
AG08	Enablement and support of business processes by Integrating applications and technology	Primary
AG09	Delivery of programs on time, on budget, and meeting requirements and quality standards	Primary
AG10	Quality of IT Management Information	Primary
AG12	Competent and motivated staff with mutual understanding of technology and business.	Secondary
AG13	Knowledge, expertise and initiatives for business innovation	Primary

4) DF 3: Risk Profile

Based on the 2019 COBIT framework, DF 3 is a continuing risk at XY University related to technology and information. Based on the severity of the issue, its effects, and its likelihood of occurring, these hazards are recognized and given points. Table 4 displays the risk profile at XY University.

Table 4. Risk Profile Universitas XY

Risk Scenario Category	Impact (1-5)	Likelihood (1-5)	Risk Rating
IT investment decision making, portfolio definition & maintenance	4	3	High Risk
Program & projects life cycle management	3	2	Normal Risk
IT cost & oversight	3	4	Very High Risk
IT expertise, skills & behavior	4	4	Very High Risk
Enterprise/IT architecture	5	3	High Risk
IT operational infrastructure incidents	4	2	Normal Risk
Unauthorized actions	3	2	Normal Risk
Software adoption/usage problems	5	3	High Risk
Hardware incidents	2	2	Normal Risk
Software failures	5	2	Normal Risk
Logical attacks (hacking, malware, etc.)	2	1	Low Risk
Third-party/supplier incidents	3	2	Normal Risk
Noncompliance	1	1	Low Risk
Geopolitical Issues	2	2	Normal Risk
Industrial action	1	1	Low Risk
Acts of nature	3	3	High Risk
Technology-based innovation	5	3	High Risk
Environmental	2	3	High Risk
Data & information management	4	3	High Risk

Copyright ©2024, JSINBIS, p-ISSN: 2502-2377, e-ISSN: 2088-3587
On-line: http://ejournal.undip.ac.id/index.php/jsinbis/article/view/59368

Based on interviews and observations made in IT-related fields, Table 4 represents problems that XY University may be facing. Crucial things that need consideration are divided into three groups, where the main priority is on risk profiles with very high risks, such as IT expertise, skills, behaviors, and IT costs and oversight. Meanwhile, several high risks issues need attention, such as enterprise and IT architecture, software adoption and usage problems, and data and information management. This mapping can be a reference for mitigating IT-related risks.

5) DF 4: Information and Technology Related Issues (I&T-Related Issues)

In DF 4, issues about the utilization of IT at XY University are described. The problems used in DF 4 are IT-related problems that XY University typically encounters. Additionally, mapping is carried out by contrasting current problems with XY University settings. The mapping outcomes are displayed in Table 5.

Table 5. I&T-Related Issues Universitas XY

IT-Related Issue	Importance (1-3)	Rating Issue
Frustration between different IT entities across the organization because of a perception of low contribution to business value	1	No Issue
Frustration between business departments (i.e., the IT customer) and the IT department because of failed initiatives or a perception of low contribution to business value	1	No Issue
Significant IT-related incidents, such as data loss, security breaches, project failure and application errors, linked to IT	2	Issue
Service delivery problems by the IT outsourcer(s)	2	Issue
Failures to meet IT-related regulatory or contractual requirements	1	No Issue
Regular audit findings or other assessment reports about poor IT performance or reported IT quality or service problems	1	No Issue
Substantial hidden and rogue IT spending, that is, IT spending by user departments outside the control of the normal IT investment decision mechanisms and approved budgets	2	Issue
Duplications or overlaps between various initiatives, or other forms of wasted resources	3	Serious Issue
Insufficient IT resources, staff with inadequate skills or staff burnout/dissatisfaction	3	Serious Issue
IT-enabled changes or projects frequently failing to meet business needs and delivered late or over budget	2	Issue
Reluctance by board members, executives or senior management to engage with IT, or a lack of committed business sponsorship for IT	2	Issue
Complex IT operating model and/or unclear decision mechanisms for IT-related decisions	2	Issue
Excessively high cost of IT	1	No Issue
Obstructed or failed implementation of new initiatives or innovations caused by the current IT architecture and systems	3	Serious Issue
Gap between business and technical knowledge, which leads to business users and information and/or technology specialists speaking different languages	1	No Issue
Regular issues with data quality and integration of data across various sources	1	No Issue
High level of end-user computing, creating (among other problems) a lack of oversight and quality control over the applications that are being developed and put in operation	1	No Issue
Business departments implementing their own information solutions with little or no involvement of the enterprise IT department (related to end-user computing, which often stems from dissatisfaction with IT solutions and services)	2	Issue
Ignorance of and/or noncompliance with privacy regulations	1	No Issue
Inability to exploit new technologies or innovate using I&T	3	Serious Issue

From Table 5. above, four serious issues related to IT at XY University were identified. These results are based on interviews with bureaus related to the use of IT in the campus environment. The first serious issue, namely duplication or overlaps between initiatives or other forms of wasted resources, is an issue that arises from the use of resources (hardware and software) that are not maximized; this is one of the causes of efficiency and effectiveness in administrative activities and unsatisfactory lectures, so this issue needs to be followed up.

Insufficient IT resources, staff with inadequate skills, or staff burnout/dissatisfaction are the other issues that are crucial due to the lack of human resources in IT management in the related bureau.

Copyright ©2024, JSINBIS, p-ISSN: 2502-2377, e-ISSN: 2088-3587
On-line: http://ejournal.undip.ac.id/index.php/jsinbis/article/view/59368

From interviews with those who handle HR and IT, it was found that the current workload owned by the IT bureau and the lack of staff in handling IT makes planning, managing, and repairing IT infrastructure in the campus environment constrained. Procurement of human resources that goes straight with the infrastructure procurement process in the IT bureau can maximize the availability and stability of IT-related services and optimize synergies with other bureaus.

Obstructed or failed implementation of new initiatives or innovations caused by the current IT architecture and systems is the third serious issue identified. One of the obstacles to digitizing business processes arises from the IT architecture, which is still insufficient for implementing the system. The plan to implement an integrated information system, planned to start in 2021, is constrained by several things, one of which is the availability of infrastructure that is still inadequate. This issue is related to the previous issue regarding the lack of human resources, so the process of planning and procuring supporting infrastructure for implementing an integrated information system is hampered and has an impact on the running of IT services in the campus environment.

The inability to exploit new technologies or innovate using I&T is the fourth crucial issue, especially in education. The implementation of the latest technology is one of the key factors in accelerating the absorption and development of knowledge; therefore, universities must be able to adapt and innovate using IT.

6) DF 5: IT Threat Landscape

DF 5 is used as a method to assist in identifying threats that may be harmful to University X. Based on the interview results, it was found that 80% of IT-related threats are considered normal, while 20% of high-risk threats occur due to human error or system failure, as shown in Figure 5.

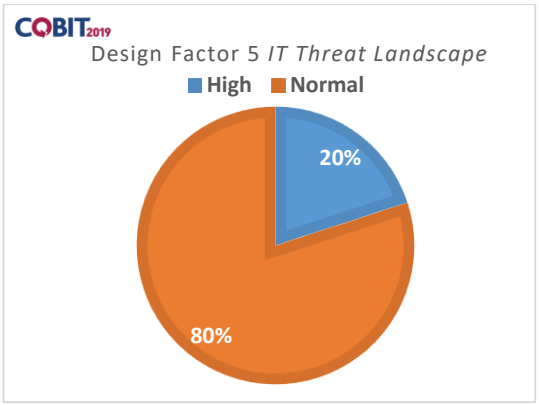

Figure 5. IT Threat Landscape

7) DF 6: Compliance Requirements

In Figure 6, the level of compliance with applicable regulations is at the Normal stage with a percentage of 90%, while the other 10% demand a high level of compliance referring to government regulations and the ministry of education in the implementation of higher education.

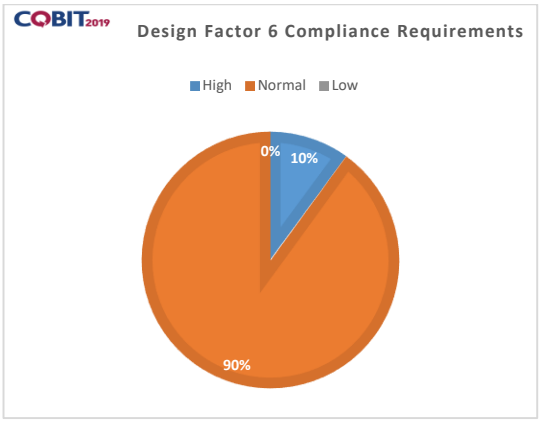

Figure 6. Compliance Requirements

8) DF 7: Role of IT

The identification results of DF 8 in Figure 7 show the role of IT at XY University. Turnaround is given a value of 5, with the role of IT seen as a driver in innovating the current administrative and academic processes. Factory is given a value of 3 considering the direct impact that can be felt by the university on the continuity and sustainability of business processes and services. Strategic is given a value of 2 because there is no critical dependence on IT for the sustainability of existing business processes, or, in other words, business processes can still be carried out manually. The support aspect is given a value of 1, considering that the expected role of IT is not only seen as limited support in providing services to users but also encouraging changes and quality improvements at XY University as a whole.

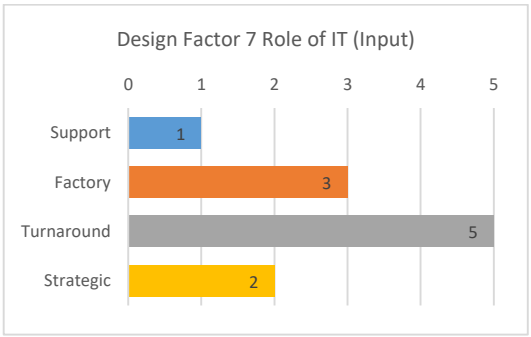

Figure 7. Role of IT

9) DF 8: Sourcing Model for IT

The Sourcing Model for IT in DF 8 is a method of managing IT management resources. As shown in Figure 8, insourcing is the most dominant approach used in the management of IT at the university, with a percentage of 80% for IT-related

Copyright ©2024, JSINBIS, p-ISSN: 2502-2377, e-ISSN: 2088-3587
On-line: http://ejournal.undip.ac.id/index.php/jsinbis/article/view/59368

systems and infrastructure, while outsourcing is 20% for supporters and third parties who collaborate with XY University, such as banks related to the financial section and ISPs for internet service providers to run the system.

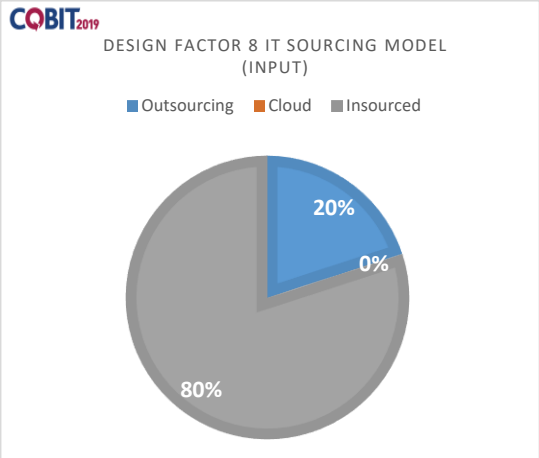

Figure 8. Sourcing Model for IT

10) DF 9: IT Implementation Method

The IT implementation method at XY University is identified with the IT implementation method in DF 9. From Figure 9, 80% of the total percentage is identified in the traditional method, where software development and operation run separately. The Agile method, with a total of 20%, weighs the suitability of continuous system development.

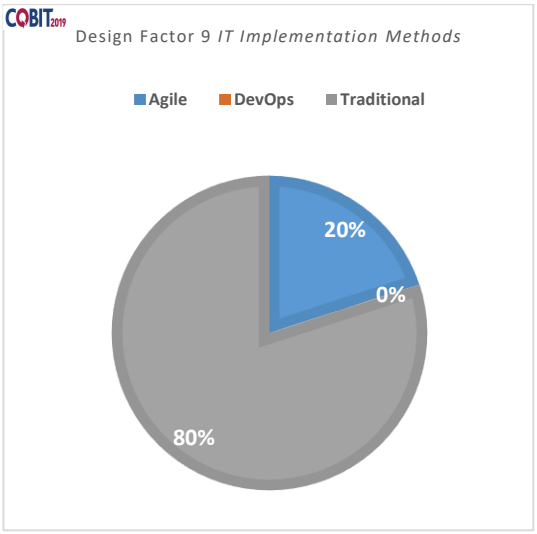

Figure 9. IT Implementation Method

11) DF 10: Technology Adoption Strategy

The technology adoption strategy is a strategy used by XY University to adapt technology, or IT, as shown in Figure 10. Based on the identification carried out, it is known that XY University is more inclined towards slow adapters compared to followers, where the technology currently adopted has been used for a long time by other universities.

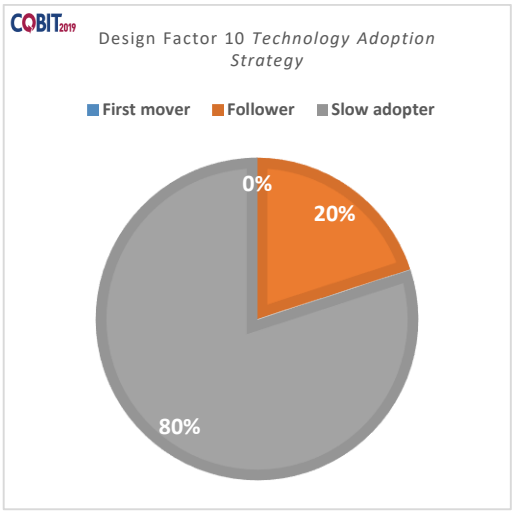

Figure 10. Technology Adoption Strategy

4.1. Discussion

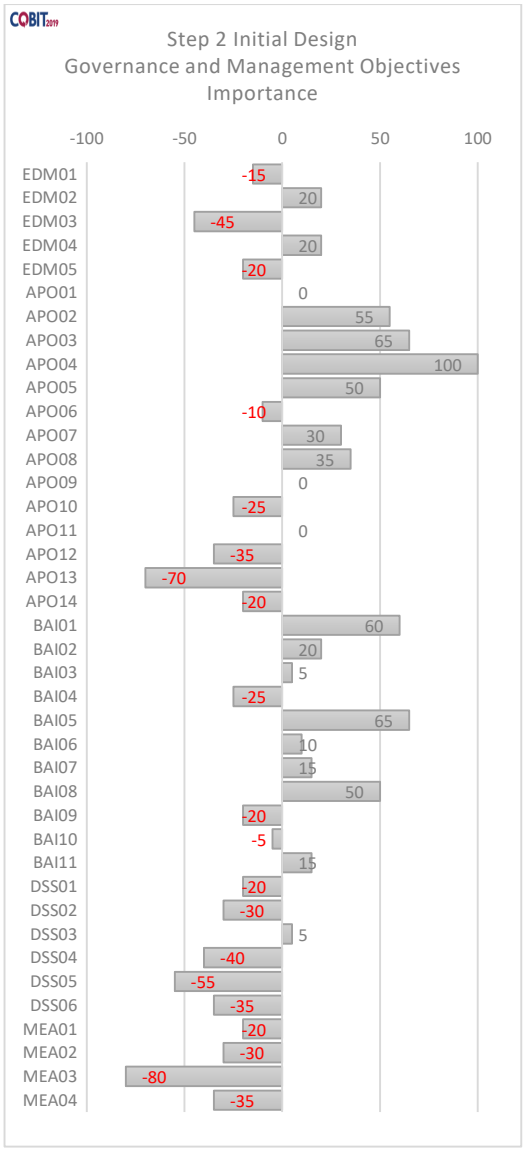

Figure 11. Initial Design of Governance and Management Objective

Copyright ©2024, JSINBIS, p-ISSN: 2502-2377, e-ISSN: 2088-3587
On-line: http://ejournal.undip.ac.id/index.php/jsinbis/article/view/59368

As seen in Figure 11, the inputs gathered from DFs 1 through 4 are combined to provide a preliminary perspective of the governance design. Figure 10b illustrates how the procedure is carried out with DF 5 to 10 until the desired results are reached. The results show the goal capability level as well as the key model processes that are deemed important with a priority level. The intended capability level is 2 if the score is 25 or more, level 3 for a score of 50 or more, and level 4 for a score of 75 or more, according to COBIT 2019, which explains that the priority level of a process is defined by the quantity of score shown.

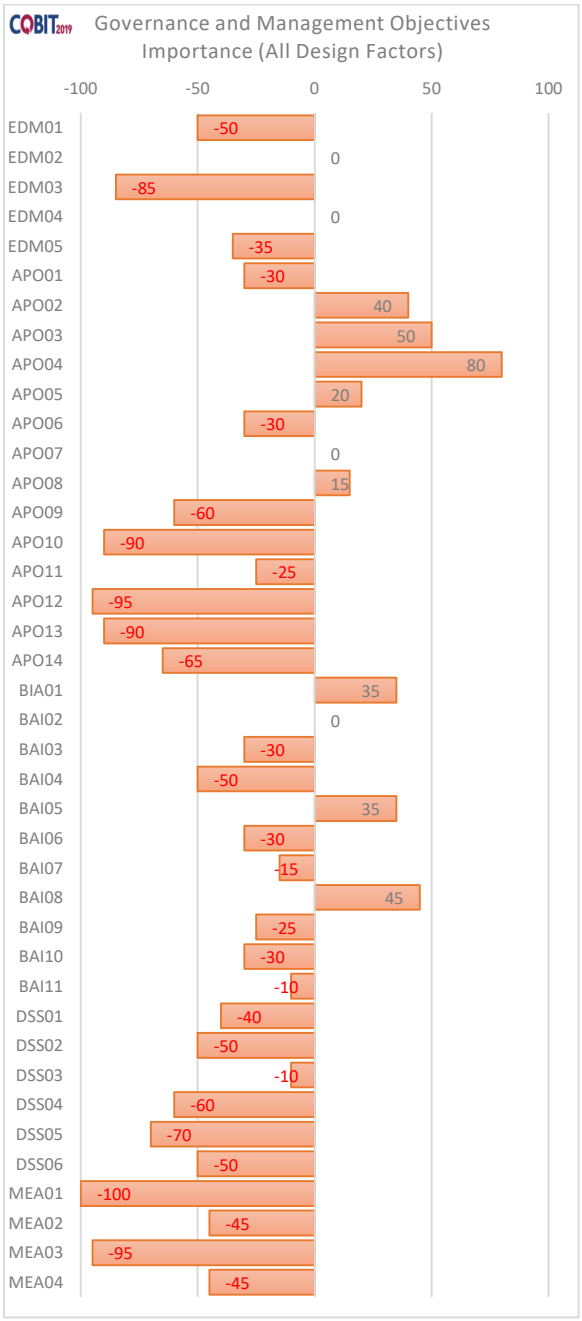

Figure 12. Governance and Management Objective Importance

Based on the results shown in Figure 12, there are 40 processes with their respective scores based on the input from the existing DF. The significance level of the processes in the governance design is represented by positive values, while processes with negative values tend to be less significant or insignificant. APO04 (Managed Innovation) with a final score of 80, is the process with the highest level of significance, followed by APO03 (Managed Enterprise Architecture) with a final score of 50, BAI08 (Managed Knowledge) at 45, APO02 (Managed Strategy) at 40, and BAI01 (Managed Programs) and BAI05 (Managed Organizational Change) at 35.

Table 6. XY University Target Capability Level

Reference	Governance/Management Objective	Target Capability Level
APO02	Managed Strategy	2
APO03	Managed Enterprise Architecture	3
APO04	Managed Innovation	4
APO07	Managed Human Resources	3
BAI01	Managed Programs	2
BAI05	Managed Organizational Change	2
BAI06	Managed IT Changes	2
BAI07	Managed IT Change Acceptance and Transitioning	3
BAI08	Managed Knowledge	2

The highest score indicates that the target capability level is at level 4. COBIT 2019 itself is not recommended for implementing capability targets at the highest level (level 5) because it is difficult to define and almost impossible to implement in the shortest possible time. In Table 6, the target capability level is set according to the score of each process in Figure 10, followed by adjustments based on interviews and documents on the strategic plan and information system development design of XY University. The adjustment was made by giving a score of 50 to the APO07 process, as well as BAI06 and BAI07, with a score of 75. The increase in scores on the four processes was carried out by considering the urgency of the existing processes and their expected impact.

APO04, with a target capability level of 4, is calculated to manage a framework that has the potential to generate innovation and ideas to improve the effectiveness and efficiency of IT operations. To achieve innovation through the application of IT, it is necessary to consider mechanisms and work culture as well as a deeper understanding of those who manage and operate technology to problems that occur in business processes or process constraints where innovation with IT can create solutions or opportunities. Just below the target capability level 4, namely level 3, there are several processes at that level.

APO03 is concerned with improving alignment, effectiveness, information quality, and cost efficiency by establishing standards, guidelines, and procedures in a common architecture consisting of business

Copyright ©2024, JSINBIS, p-ISSN: 2502-2377, e-ISSN: 2088-3587
On-line: http://ejournal.undip.ac.id/index.php/jsinbis/article/view/59368

processes, information, data, applications, and technology architecture. This architecture is the basis and target in line with the strategy of University X and IT. APO07 relates to optimized, planned, and evaluated recruitment, acquisition, and development of human resources (both internal and external) with a structured approach. BAI07 relates to managing IT change and its transition by implementing solutions safely and in accordance with agreed expectations and outcomes, which include implementation planning, system and data conversion, testing, communication, release preparation, promotion of new business processes and IT services, and post-implementation evaluation.

Processes that are prioritized for XY University are in the APO and BAI domains because the scores are above the range of 50 to 100 and the target capability level is at levels 3 and 4. Processes with scores below 50 do not mean can be ignored, but they are not prioritized for XY University in implementing IT governance. Furthermore, the APO domain focuses on planning, adjusting, and managing the overall organization, strategy, and support activities for IT, while the BAI domain focuses on the development and implementation of information systems and their integration in business processes, considering stakeholder needs and encouraging all parties to achieve the goals and vision of the established mission. The recommendations needed to achieve the capability targets are described in Table 7.

Table 7. Recommendations

Reference		Description
APO02	1.	Identify and reference existing regulations from both the government and other related agencies to be able to determine operational standards.
	2.	Provide the IT resources needed to support service development and performance efficiency in each unit.
	3.	Create feedback on the use of existing infrastructure so that it is appropriate.
	4.	Establish work guidelines for each unit for the division of roles and responsibilities among individuals per their positions.
	5.	Create a risk mitigation strategy related to the use of IT at XY University.
APO03	1.	Evaluate the course of IT resource procurement and RIPSTI to ensure IT implementation targets are on track.
	2.	Establish service standards for the facilities and infrastructure of XY University, especially in the IT field.
	3.	Establish a general architecture as a reference in IT implementation.
APO04	1.	Evaluate the current business processes to find out which have not been digitized.
	2.	Make evaluations related to the use of IT infrastructure and analyse the current IT developments to find technologies that can be applied in the business processes of XY University.
	3.	Conducting cooperation and coordination with other universities in the IT field as a means of exchanging information and developing infrastructure and services.
	4.	Conduct post-implementation monitoring of IT resources to ensure the level of user adaptation (lecturers, staff, and students).
	5.	Conduct training related to the use of IT to increase innovation in facilitating business processes that run at XY University.
APO07	1.	Make a labour augmentation plan according to priority.
	2.	Conduct performance evaluations to determine the number of human resources required.
	3.	Organize systematic and periodic training to improve the quality of human resources.
BAI01	1.	Create a plan that includes the resources and costs required for the implementation of the new information system.
	2.	Supervise and control the process of implementing the new information system and create documentation.
	3.	Create information system mitigation guidelines and a post-implementation evaluation.
BAI05	1.	Establish rules for business process changes that must be done digitally.
	2.	Provide training on digital business processes to raise awareness of the ease and efficiency they bring.
BAI06	1.	Analyse any feedback received on leasehold replacement requests, categorize, evaluate impacts, and mitigate.
	2.	Make plans and proposals for IT infrastructure replacement based on priority and urgency.
	3.	Create documentation after the IT infrastructure change to see the suitability of the results obtained.
BAI07	1.	Create a detailed IT resource implementation plan.
	2.	Audit the system and data conversion process.
	3.	Create a user manual for the new information system.
	4.	Conduct post-implementation assistance.
BAI08	1.	Create documentation of training materials that can be accessed by HR to support skill and competency development.
	2.	Cultivate the sharing of information and knowledge between HR, such as solutions if there are system constraints and innovations that can be done through the system.
	3.	Provide digital information resources about XY University's business processes by determining the level of access according to the user.

5. Conclusion

Based on the results of data analysis using the COBIT 2019 framework, an IT governance design suitable to be used at XY University was obtained. Recommendations that are provided concerning factors which may be useful in selecting the most crucial processes in implementing the research result based on the capacity level to help the institution meet its objectives. The university will be able to control information technology with effective and efficient procedures that may enhance the quality of education and services by using proposed IT governance design.

Acknowledgments

The author is grateful to those who have encouraged the preparation of this paper and to the two lecturers who have played an active role in directing this research until it is completed. The author is also grateful to XY University for being willing to be a case study for this research, as well as to stakeholders who have been willing to spend time in interviews and discussions at XY University. Hopefully, this research can be a reference for the improvement of the quality of XY University.

Daftar Pustaka

Alonso, I.A., Caro, E.T., Verdún, J.C., García, N.A.B., 2020. Factors Influencing the Implementation of IT Governance in Public Universities. *2020 2nd International Conference on Advances in Computing, Communication Control and Networking (ICACCCN)*, 89-94. https://doi.org/10.1109/ICACCCN51052.2020.9362790

Anastasia, P.N., Atrinawati, L.H., 2020. Perancangan Tata Kelola Teknologi Informasi Menggunakan Framework COBIT 2019 pada Hotel XYZ. *JSI: Jurnal Sistem Informasi (E-Journal)*, 12(2). https://doi.org/10.36706/jsi.v12i2.12329

Asterinadewi, T., Handoko, Y., 2018. Asesmen Kapabilitas Menggunakan Kerangka Kerja COBIT 5 Process Assessment Model dalam Penerapan Tata Kelola Teknologi Informasi. *Jurnal Tata Kelola Dan Kerangka Kerja Teknologi Informasi*, 3(2), 61–70. http://dx.doi.org/10.34010/jtk3ti.v3i2.463

Audia, R., Sugiantoro, B., 2022. Evaluation and Implementation of IT Governance Using the 2019 COBIT Framework at the Department of Food Security, Agriculture and Fisheries of Balangan Regency. *IJID (International Journal on Informatics for Development)*, 11(1), 152–161. https://doi.org/10.14421/ijid.2022.3381

Bernika, H., Nuryana, I.K.D., 2021. Perancangan Tata Kelola Teknologi Informasi Menggunakan Kerangka Kerja COBIT 2019 (Studi Kasus: LPP RRI Madiun). *JEISBI*, 2(3), 63–70.

Fadhilah, R., Santosa, I., Abdurrahman, L., 2021. Rencana Audit Teknologi Informasi Menggunakan COBIT 2019 pada Unit Isti Universitas Telkom. *Jurnal Informatika dan Komputer*, 4(3), 157–163. https://doi.org/10.33387/jiko.v4i3.3325

Gallaran, F.B., Pagiu, C., Palelleng, S., 2022. Audit Sistem Informasi Akademik Universitas Kristen Indonesia Toraja dengan Menggunakan framework COBIT 5. *Faktor Exacta*, *15*(3), 174–179.

Gunawan, W., Kalensun, E.P., Fajar, A.N., Sfenrianto, 2018. Applying COBIT 5 in Higher Education. *IOP Conference Series: Materials Science and Engineering*, 420. https://doi.org/10.1088/1757-899X/420/1/012108

Harits, A., Gernowo, R., Suseno, J.E., 2022. Adaptation of Information Systems Strategic Planning of Universities Using COBIT 2019 in Post Covid-19. *JST: Jurnal Sains dan Teknologi*, 11(2), 339–350. https://doi.org/10.23887/jstundiksha.v11i2.48365

Haster, A.P., Hartomo, K.D., 2022. Analisis Tingkat Kematangan Smart City Kabupaten Lombok Utara Menggunakan COBIT 2019. *Jurnal Media Informatika Budidarma*, 6(3), 1459. http://dx.doi.org/10.30865/mib.v6i3.4344

ISACA. (2018a). *COBIT® 2019: Designing an Information and Technology Governance Solution*. ISACA.

ISACA. (2018b). *COBIT® 2019: Governance and Management Objectives*. ISACA.

Legowo, N., Christian, 2019. Evaluation of Governance Information System using Framework COBIT 5 in Banking Company. *2019 International Conference on Sustainable Engineering and Creative Computing (ICSECC)*, 281–286. https://doi.org/10.1109/ICSECC.2019.8907123

Lestari, M., Iriani, A., Hendry, 2022. Information Technology Governance Design in DevOps-Based E-Marketplace Companies Using COBIT 2019 Framework. *INTENSIF*, 6(2), 233–252. https://doi.org/10.29407/intensif.v6i2.18104

Lompoliu, E.M., Francolla, G.B.R.F., Mandoya, G.R., Walangitan, M.D., Mambu, J.Y., 2022. Information Technology Governance Analysis Using The COBIT 2019 Framework at XYZ Institution. *CogITo Smart Journal*, 8(2), 346–358. https://doi.org/10.31154/cogito.v8i2.427.346-358

Murad, D.F., Fernando, E., Irsan, M., Kosala, R.R., Ranti, B., Supangkat, S.H., 2018. Implementation of COBIT 5 Framework for Academic Information System Audit Perspective: Evaluate, Direct, and Monitor. *2018 International Conference on Applied Information Technology and Innovation (ICAITI)*, 102–107. https://doi.org/10.1109/ICAITI.2018.8686700

Nurcahya, H., Setiawan, E., Permana, B., 2022. Information Technology Governance Audit Using COBIT Framework 2019 (Case Study: Mandiri University). *Budapest International Research and Critics Institute (BIRCI-Journal) : Humanities and Social Sciences*, 5(1), 8030–8038.

Permenristekdikti No. 62, Tahun 2017.

Riadi, F.T., Manuputty, A.D., Saputra, A., 2018. Evaluasi Manajemen Risiko Keamanan

Informasi dengan Menggunakan COBIT 5 Subdomain EDM03 (Ensure Risk Optimisation). *Jutei*, 2(1), 1–10. https://doi.org/10.21460/jutei.2018.12.53

Safitri, A., Syafii, I., Adi, K., 2021. Identifikasi Level Pengelolaan Tata Kelola SIPERUMKIM Kota Salatiga berdasarkan COBIT 2019. *Jurnal RESTI (Rekayasa Sistem dan Teknologi Informasi)*, 5(3), 429–438. https://doi.org/10.29207/resti.v5i3.3060

Salegar, I., Rizal, S., 2020. Evaluasi Kematangan Tata Kelola Sistem Informasi Akademik Perguruan Tinggi menggunakan COBIT 5.0. *Seri Prosiding SENADI*, 4(1), 87–90.

Saleh, M., Yusuf, I., Sujaini, H., 2021. Penerapan Framework COBIT 2019 pada Audit Teknologi Informasi di Politeknik Sambas. *Jurnal Edukasi dan Penelitian Informatika (JEPIN)*, 7(2), 204. https://doi.org/10.26418/jp.v7i2.48228

Samsinar, Sinaga, R., 2022. Information Technology Governance Audit at XYZ College Using COBIT Framework 2019. *Berkala Sainstek*, 10(2). https://doi.org/10.19184/bst.v10i2.30325

Saputra, M.A., Redo, M.R., 2021. Penerapan Framework COBIT 2019 untuk Perancangan Tata Kelola Teknologi Informasi pada Perguruan Tinggi. *Journal of Science and Social Research*, *4*(3), 352. https://doi.org/10.54314/jssr.v4i3.715

Saridewi, A.I., Wiharta, D.M., Sastra, N.P., 2018. Evaluation of Integrated University Management Information System Using COBIT 5 Domain DSS. *2018 International Conference on Smart Green Technology in Electrical and Information Systems: Smart Green Technology for Sustainable Living, ICSGTEIS 2018 - Proceeding*, *7*, 210–214. https://doi.org/10.1109/ICSGTEIS.2018.8709144

Sipayung, A.B., Yunis, R., Elly, E., 2022. Evaluation Of Information Technology Governance at Mikroskil University Using COBIT 2019 Framework with BAI11 Domain. *International Journal of Research and Applied Technology*, *2*(2), 128–143. https://doi.org/10.34010/injuratech.v2i2.8085

Tulus, B.V., Tanaamah, A.R., 2023. Design of Information Technology Governance in Educational Institutions Using COBIT 2019 Framework. *Journal of Information Systems and Informatics*, *5*(1), 31–43. https://doi.org/10.51519/journalisi.v5i1.408

Wabang, K., Rahma, Y., Widodo, A. P., & Nugraha, F., 2021. Tata Kelola Teknologi Informasi Menggunakan COBIT 2019 pada PSI Universitas Muria Kudus. *Jurnal Teknologi dan Sistem Informasi*, *VII*(3), 275–282.

Yasin, M., Arman, A.A., Edward, I.J.M., Shalannanda, W., 2020. Designing Information Security Governance Recommendations and Roadmap Using COBIT 2019 Framework and ISO 27001:2013 (Case Study Ditreskrimsus Polda XYZ). *Proceeding of 14th International Conference on Telecommunication Systems, Services, and Applications, TSSA 2020*, *2013*(95), 3–7. https://doi.org/10.1109/TSSA51342.2020.9310875