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Smart Campus Governance Design for XYZ Polytechnic Based on COBIT 2019

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Abstract— Technological developments drive growth in the industrial revolution and digital transformation era. Technological developments during the industrial revolution 4.0 affect characteristics, especially in work. In responding to the change in technological developments in employment, the Ministry of Public Works has the task of conducting public works affairs in the government environment in an orderly manner to support the president in administering state government. XYZ Polytechnic is a state university as a new pilot under the Ministry of Public Works, Republic of Indonesia. As a basis for future development as well as towards a smart campus and then getting policy directions for the development of smart campus governance at the XYZ Polytechnic, it is necessary to design IT governance, especially in the reconstruction of adaptive and responsive policies and the development of structured governance with structured information systems. This study uses COBIT 2019 as the framework for governance design. With the method from the field preparation stage, interviews then assessed and evaluated existing policies and conditions of field activities to create governance designs according to COBIT 2019. The research results contained a technology governance management design with 17 processes. Based on the capability assessment and gap analysis results, recommendations were made for XYZ Polytechnic, as discussed in the results section. The suggestions are in the form of recommendations related to people, processes, and the use of technology. The recommendations act as evaluation material to improve organizational performance by providing good smart campus governance to students and internal members of XYZ Polytechnic.

Keywords— COBIT 2019; smart campus; IT governance.

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I. INTRODUCTION

Technological developments in the Industrial Revolution 4.0 era affect the characteristics in the world of work. Where between the skills and competencies possessed must be considered? The challenges of the revolution itself must be answered quickly and accurately by all parties involved [1]. XYZ Polytechnic is a new pilot state university under one of the ministries in Republic Indonesia, led by a director who reports to the Minister through the Head of the Human Resources Development Agency (BPSDM). The current condition of XYZ Polytechnic is how to encourage growth in the era of the industrial revolution and digital transformation, especially in the reconstruction of adaptive and responsive policies and development of structured governance with a structured information system so that XYZ Polytechnic can implement it.

There is a need for planning to develop policy and smart campus governance. As a basis for action in XYZ

Polytechnic, it is necessary to obtain a Smart Campus development policy direction with that essential element that must be a concern in this research regarding smart campus governance. Reconstruction in the form of governance at the policy, organizational, and operational levels of organizations adapting and responding to the industrial revolution 4.0 in developing the required trans-disciplines and study programs are needed.

By utilizing information technology to improve the quality of services in the organization to meet business needs, especially in the field of governance, the organization can adapt to existing advances. The evaluation determines how the organization implements information technology in almost all business processes, applications, information systems, networks, hardware, data/information, and infrastructure to improve information technology services at XYZ Polytechnic.

In supporting the activities of the smart solution for the campus, it has three enablers that must be interrelated, namely

the human, process, and technology dimensions. The three dimensions are as follows:

- The human resource dimension acts as an academic community or activity driver in a smart campus.
- The process dimension supports activities in the smart campus, including policy procedures in the organization.
- The technology dimension focuses on problems in implementation, such as the existing infrastructure in the organization.

Several standard models of information technology governance are widely recognized to determine the extent to which information technology governance is sound. Some of them are The IT Infrastructure Library (ITIL), Control Objectives for Information and related Technology (COBIT), and ISO/IEC 27001[2]. These standards ensure that the purpose of implementing information technology in an organization is under the expected goals and avoids risks. Of the three standard information technology governance models, the chosen framework is COBIT. COBIT has components to build and manage information technology systems such as processes, organizational structures, policies and procedures, information flow, culture and behavior, skills, and infrastructure[3]. COBIT determines the design factors that the organization should consider building the most suitable information technology governance system and address the issues by grouping the relevant components into governance and management and then defining all the elements that describe which decisions should be taken and how. In 2018 The Information Systems Audit and Control Association (ISACA) released the latest series, COBIT 2019. Several new settings, such as using design factors, allow COBIT to adopt better alignment with particular contexts[4]. Various frameworks can be used as guidelines to create information technology governance. One of the frameworks used is the Control Objective for information and related technology, commonly known as COBIT [5]. COBIT is an internationally recognized and applied best practice regarding information, information technology, and organizational risks [6].

This study aims to find a design for information technology governance systems using COBIT 2019. The method used by researchers is from the observation preparation stage, interviews. It then assesses and evaluates existing policies and conditions of field activities to design governance designs according to COBIT 2019[7]–[9]. The final results in this study include evaluation results of several governance and management objectives as guidelines in implementing procedures within the XYZ Polytechnic[10]. The governance system design obtained will be adjusted to the design factors of COBIT 2019.

Previous research in developing governance using COBIT 2019 has been carried out as follows:

- Information technology governance during a pandemic also has a major influence on the implementation of teaching and learning activities in universities to ensure the quality of the learning and teaching process carried out so that it must be known the shortcomings and advantages of governance which is carried out by conducting further analysis of technology governance under the initial goal of education at the university.[11]

- In carrying out its functions and duties, a good governance system is needed so that the achievements in the information technology field follow ITK's strategy and business context. Information technology governance systems must be managed and appropriately implemented to support business process activities in IT. The study results recommendations from the core model or process and the priority and capability levels that must be implemented [12].
- The expected information technology management can be fulfilled and carried out well because the value between the average level when the research was conducted compared to the recommended level shows a gap that is not too large.[13].
- Appropriate information technology governance will help organizations to be able to compete with other competitors; therefore, the application of technology governance using the COBIT 2019 framework will significantly influence the company's goals [14].
- In response to the demands of information technology developments, KAN calls on calibration laboratory organizations to develop information technology and its management using COBIT 2019 [15].

Assessment of process capability level and COBIT 2019 based on COBIT on several objects as follows: higher education [17], at University XYZ [18], PT XYZ [19], Hotel XYZ [20], XYZ Hospital [21], Government Unit [22], and University Muria [23] also used as references for this research.

II. MATERIALS AND METHODS

The research method used in designing the IT governance system refers to phases from the 2019 COBIT governance design workflow. It can be seen in Fig. 1 below

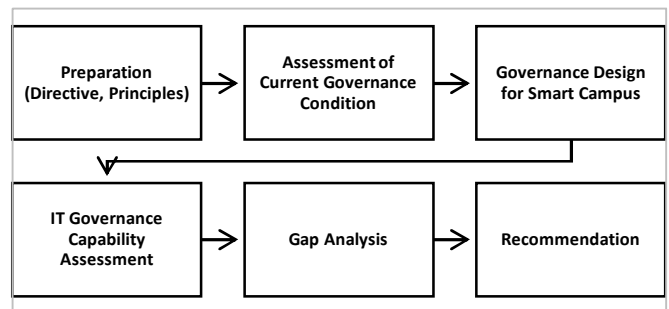


Fig. 1 Research Methodology

The first phase is Preparation Stage (Directions, Principles). This stage involves interviews with stakeholders and observations to understand the initial steps in designing IT governance. The actions taken are to identify the strategies of the XYZ Polytechnic. This phase or stage is the basis for understanding and determining organizational strategy, goals, and information technology issues based on the 2019 COBIT design factors criteria. After the first stage, the next phase is the Assessment of Current Governance Condition. This phase or stage conducts interviews and observations with stakeholders to collect data on determining the scope of the governance design system aspects from COBIT 2019 design factor 1 to design factor 10. The final phase or stage is Smart Campus Governance Design to find an IT governance design

system that fits the organization's IT needs, resulting in several possible improvements to the governance system and acquiring a score for each process on a scale of -100 to 100 for the design to be concluded. The activities in the selected domain process are assessed after the relevant governance design is done. The purpose of the evaluation is to find out the current capability and the gaps that must be filled to help solve the problems at XYZ Polytechnic.

The provisions of the assessment score from the assessment capability have several criteria that must be considered for filling out the assessment. The assessment criteria are mentioned in Table 1 below.

TABLE I
ASSESSMENT CRITERIA

Score		Description
Answer	Score	
<i>Yes</i>	1	The activity already exists and has been executed
<i>Partially</i>	0.5	The activity already exists and has not been fully executed
<i>No</i>	0	The activity does not exist and has not been executed
<i>N. A</i>	0	Activities are unrelated and unplanned

Rating is obtained after carrying out a series of assessment activities according to the criteria in the table above. It is used as a parameter whether the activities in the domain of governance design results have met the requirements for the 2019 COBIT framework or not. The process activity rating can be seen in Table 2.

TABLE II
ACTIVITY RATING

Level	Achievement	Description
<i>Fully</i>	85%-100%	Evidence of attainment of attributes is found to be exhaustive in assessing processes such as approaches systematically and full achievement
<i>Largely</i>	50%-85%	Evidence of attribute achievement is found primarily in assessing processes such as systematic approach and significant achievement
<i>Partially</i>	15%-50%	Evidence of attainment of attributes was found in some of the assessing processes, such as approaches or unpredictable achievements
<i>Not</i>	0%-15%	Evidence of attainment of the attributes found in assessing processes is scant or non-existent

This study uses the process capability level of COBIT 2019. The assessment of the process capability level can be determined through the process activity rating obtained. If the activity rating is met (Fully), it can proceed to the next activity assessment stage with a higher level of process capability. Suppose the full activity rating is not met (Largely, Partially, Not), the next activity assessment stage cannot proceed. It stops at the process capability level whose activity rating is not met. The following explains the process capability levels and the characteristics of each group.

TABLE III
LEVELS AND THE CHARACTERISTICS OF CAPABILITY

Level	Characteristics
5	The process of achieving its goals is well defined, performance is measured to improve performance, and the organization should make continuous improvements.
4	The process achieves its objectives, well-defined, and measured performance (quantitatively).
3	Process of achieving its goals in a much more organized manner using the assets of the XYZ Polytechnic. Procedures are usually well defined.
2	The process of achieving organizational goals is to execute a basic but comprehensive set of activities that can be described as completed.
1	Process more or less achieves its goals by implementing an incomplete set of activities characterized as early or not very organized.
0	<ul style="list-style-type: none"> Lack of basic skills Incomplete approach to addressing governance and management objectives It does not meet the intent of any process practice

The Calculation of assessment capability using a predetermined assessment to calculate in the evaluation of the data in the Questionnaire so that you get a process activity rating based on the COBIT 2019 Introduction and Methodology can be seen in the formula below.

$$Value = \frac{a+b+i}{y} \times 100\% \quad (1)$$

Description:

A = The first activity is per the capability level in management practice.

b = The second activity is per the capability level in management practice.

i = The following action is per the capability level in management practice.

y = The number of moves per the management practice's capability level.

If the value of 15% of the result is not, the assessment stops at that capability level. If the value of 50% of the results obtained is Partial, the assessment stops at that capability level. If the value is 85%, the result obtained is Large, and the assessment stops at that capability level. If the value is 85%, the result obtained is Full, which means that the assessment stops at that capability level

The analysis is carried out to determine the potential for development per the findings of the current gap at the XYZ Polytechnic. Development potential is determined based on three aspects: people, process, and technology, as recommendations for improvement. The following is an analysis of the potential for development at XYZ Polytechnic.

TABLE IV
IMPROVEMENT RECOMMENDATION TYPE

Recommendation Type		
<i>People</i>	<i>Process</i>	<i>Technology</i>
<i>Roles</i>	<i>Policy</i>	<i>Tools</i>
<i>Responsibility</i>	<i>Procedure</i>	<i>Features</i>
<i>Skill & Awareness</i>	<i>Work Instruction</i>	
<i>Communication</i>	<i>Record</i>	

III. RESULT AND DISCUSSION

The first phase, Preparation Stage (Directions, Principles), results in XYZ Polytechnic's strategy focusing on several stakeholders such as students and lecturers. The vision of XYZ Polytechnic is to create an excellent Polytechnic with student outputs that are competent, professional, highly competitive, and ready to work. Content of technology currently being faced is how to make a Polytechnic by relying on technology such as future developments and in the context of an innovative campus. For the second phase, the Assessment of Current Governance Condition result can be derived from several design factors as follow:

A. Corporate Strategy

After analysis, Enterprise Strategy at XYZ Polytechnic's highest score of 5 is in Service Client, meaning that XYZ Polytechnic is very concerned about services to educators and students. It can be seen in Fig. 2.

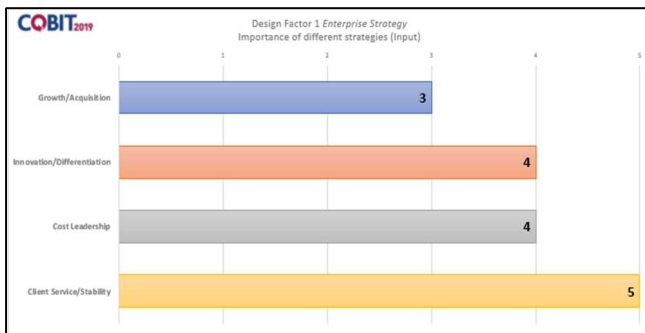


Fig. 2 Design Factor 1 Enterprise Strategy

B. Company Goal

Achieving organizational goals or targets can be determined by preparing strategies to achieve these goals. The XYZ Polytechnic case study focuses mainly on EG5 customer-oriented service because it describes a customer-oriented service culture. The organizational objectives of XYZ Polytechnic can be seen in Fig. 3.

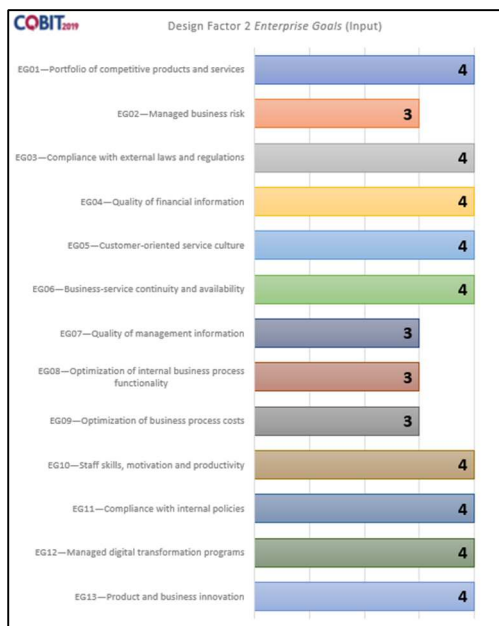


Fig. 3 Design Factor 2 Enterprise Goals

C. Risk Profile

To identify and know the types of risks facing the organization today. In the case study of XYZ Polytechnic, the high-risk profile is at a value of 12, which relates to IT needs, data, and potential changes that occur at XYZ Polytechnic. It can be seen in Fig. 4.

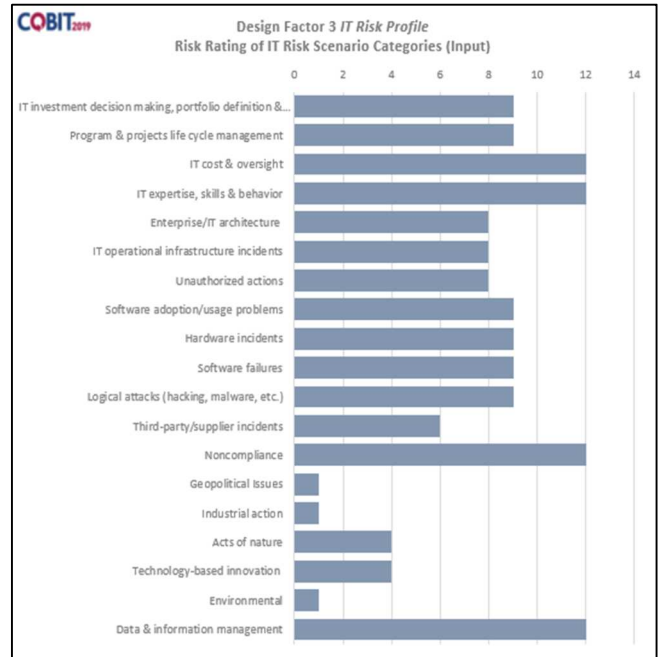


Fig. 4 Design Factor 3 IT Risk Profile

D. Current IT-Related Issues

In assessing I&T risk, one must consider the organization's IT-related issues today. In the case study of XYZ Polytechnic, the average IT-related problem is 2, meaning that it becomes an issue that XYZ Polytechnic must consider and respond responsively to the issues. It can be seen in Fig. 5.

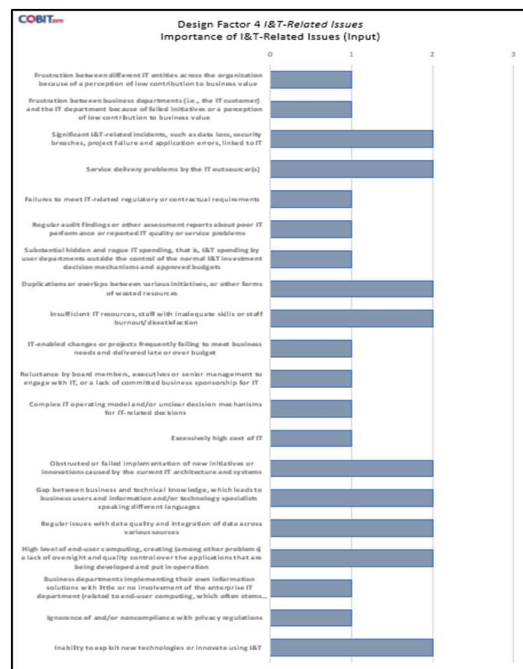


Fig. 5 Design Factor 4 IT Related Issues

E. Threat Landscape

After analyzing the threat landscape to the XYZ Polytechnic operationally, the resulting threat landscape graph at the XYZ Polytechnic is normal because all the threats can be handled by themselves and do not need specific threat treatment. Can be seen in Fig. 6.

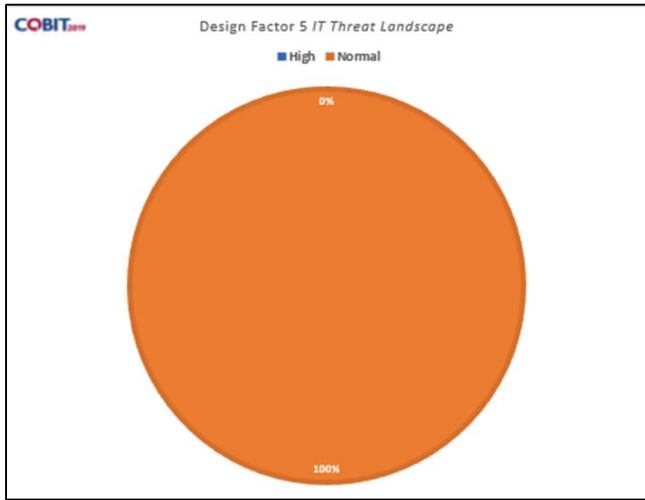


Fig. 6 Design Factor 5 IT Threat Landscape

F. Compliance Needs

Analysis of compliance requirements as an organizational basis that can be classified, resulting in a graph of compliance needs, can be seen in Fig. 7.

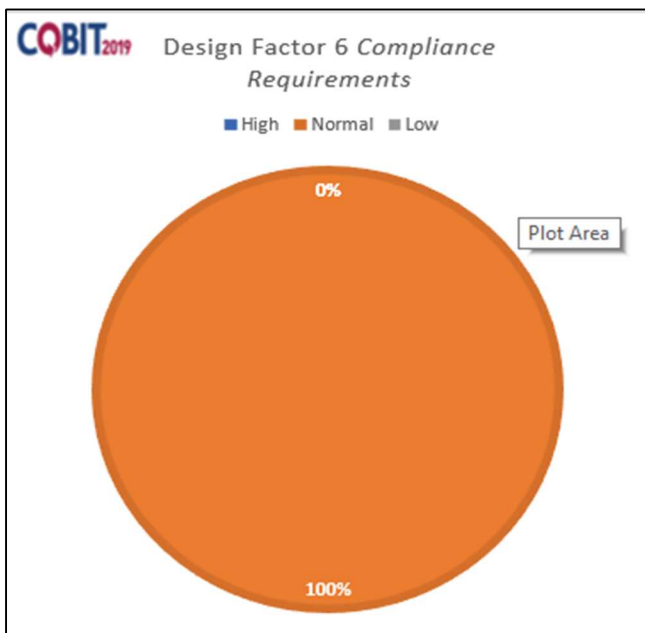


Fig. 7 Design Factor 6 Compliance Requirements

G. The Role of IT

After analyzing the role of IT in the organization, a role design for IT is produced. IT at XYZ Polytechnic has a strategic role in creating the smart campus vision. It can be seen in Fig. 8.

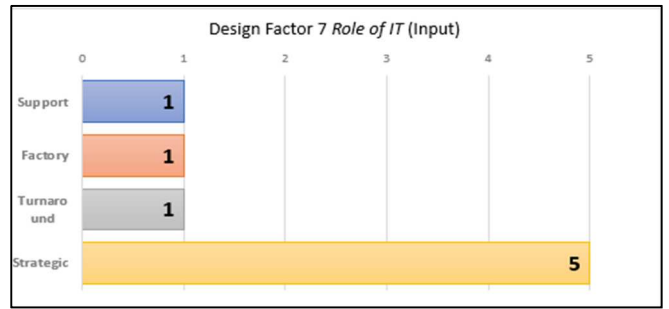


Fig. 8 Design Factor 7 Role of IT

H. Sourcing Model for IT

After analyzing the source model of IT in the organization, the outsourcing section has a value of 50%. The insourced part has a value of 30%. The cloud portion has a value of 20%, so the resulting source model design from IT can be seen in Fig. 9.

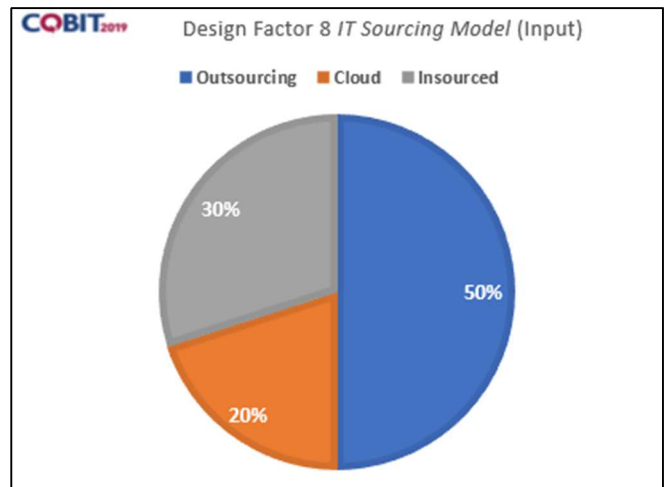


Fig. 9 Factor 8 IT Sourcing Model

I. IT Implementation Method

Analysis of the IT implementation method applied by the XYZ Polytechnic is known by using Agile Development and Waterfall (classic), resulting in a design factor for the IT implementation method that can be seen in Fig. 10.

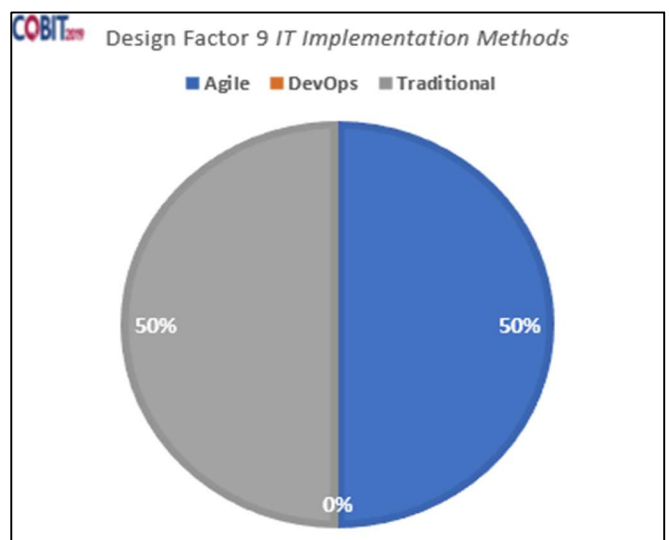


Fig. 10 Design Factor 9 IT Implementation Methods

J. Technology Adoption Strategy

The strategy on the part of the followers has a value of 75%. The first mover part has a value of 15%, and the slow adapter section has a value of 10%. Based on the analysis, the Technology Adoption Strategy in the XYZ Polytechnic case study can be seen in Fig. 11.

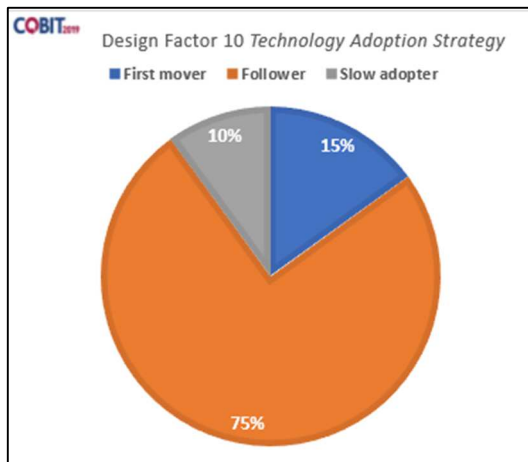


Fig. 11 Design Factor 10 Technology Adoption Strategy

The final phase of the Smart Campus Governance Design result combines all the input information collected from evaluating previous 10-factor designs to produce a governance design scope. Core models with a value of 35 or more include EDM02, EDM04, APO08, APO11, APO13, BAI01, BAI02, BAI03, BAI04, BAI05, BAI06, BAI07, BAI08, BAI10, BAI11, DSS03, and DSS06. The results of the governance design in the XYZ Polytechnic case study can be seen in Fig. 12.

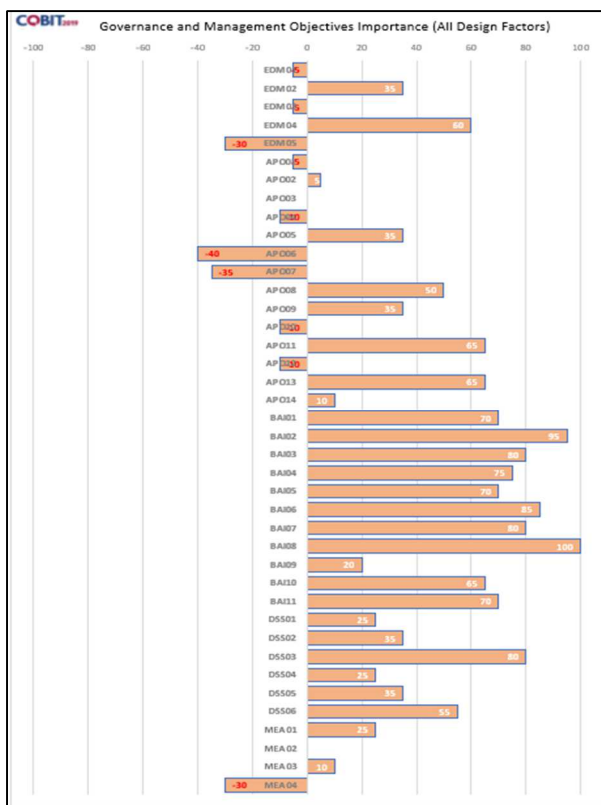


Fig. 12 All Design Factors

K. Capability Assessment Results of Management Objectives: Example of DSS (Deliver, Service, and Support)

The capability assessment analysis results of management objectives example for DSS domain are shown in Table 5.

TABLE V
CAPABILITY ASSESSMENT RESULTS EXAMPLE FOR DSS DOMAIN

Domain	No.	Management Practice	Fulfilment	Level
DSS03 (Managed Problems)	1	DSS03.01 Identify and classify problems		2
	2	DSS03.02 Investigate and diagnose problems		3
	3	DSS03.03 Raised known errors	0% Not	2
	4	DSS03.04 Resolve and close problems		2
	5	DSS03.05 Perform proactive problem management.		3
DSS06 (Managed Business Process Controls)	1	DSS06.01 Align control activities embedded in business processes with enterprise objectives.	67% Largely	2
	2	DSS06.02 Control the processing of information.	100% Fully	2
	3	DSS06.03 Manage roles, responsibilities, access privileges, and levels of authority	100% Fully	2
	4	DSS06.04 Manage errors and exceptions	0% Not	2
	5	DSS06.05 Ensure traceability and accountability for information events	100% Fully	3
	6	DSS06.06 Secure information assets	100% Fully	4

L. Gap Analysis Results of Management Objectives: Example of DSS (Deliver, Service, and Support)

After getting the results of assessment capability on each activity in the domain, the next step is to analyze the gap. The results of management objectives examples for the DSS domain are shown in Table 6.

TABLE VI
GAP ANALYSIS RESULTS EXAMPLE FOR DSS DOMAIN

Domain	No.	Management Practice	GAP Analysis
DSS03 (Managed Problems)	1	DSS03.01 Identify and classify problems	There is no helpdesk procedure or helpdesk management in XYZ Polytechnic yet
	2	DSS03.02 Investigate and diagnose problems	
	3	DSS03.03 Raised known errors	
	4	DSS03.04 Resolve and close problems	
	5	DSS03.05 Perform proactive problem management.	

Domain	No.	Management Practice	GAP Analysis
DSS06 (Managed Business Process Controls)	1	DSS06.01 Align control activities embedded in business processes with enterprise objectives.	Risk-based control implementation of automatic control, end-to-end control, and improvement of design and business processes still does not exist
	2	DSS06.02 Control the processing of information.	There is no data transaction authorization yet. The integrity of the data transmission of data accurately
	3	DSS06.03 Manage roles, responsibilities, access privileges, and levels of authority	There is no segregation of duties for sensitive activities, access rights per threats, risks, technology, and business needs, and no harmonized access rights controls are reviewed.
	4	DSS06.04 Manage errors and exceptions	There is no policy regarding the helpdesk procedure regarding error management (error)

M. Result of Potential Improvement

Analysis to determine potential improvement from the current GAP at XYZ Polytechnic. They were done based on three aspects: people, process, and technology, as recommendations for improvement. Examples of domain DSS03 (Managed Problems) are shown in Table 7.

TABLE VII
POTENTIAL DEVELOPMENT EXAMPLE FOR DSS03 DOMAIN

Gap Analysis	Aspect	Type	Potential Improvement
There is no helpdesk procedure or helpdesk management in XYZ polytechnic yet	Process	Policy	There is a need for policies regarding procedures related to problem classification, how to investigate problems, document problems, problem-solving, and pain management to be incorporated into rational documents and provide troubleshooting guide resulting from the incident and identify validated solutions.
	Technology	Tools	The technology needed for implementation is that there must be a problem tracking/resolution system that can overcome problem management

N. Recommendation Result

The initiative develops from the potential improvement for the actual implementation by XYZ Polytechnic. Examples of Domain DSS03 (Managed Problems) are shown in Table 8.

TABLE VIII
POTENTIAL IMPROVEMENT EXAMPLE FOR DSS03 DOMAIN

Priority	Potential Improvement	Aspect	Solution Needed
1	There is a need for policies regarding problem classification, how to investigate problems, document problems, problem-solving, and pain management to be incorporated into Rational Documents and guide dealing with issues resulting from incidents and identifying validated solutions.	Process	It is necessary to design policies for documenting procedures related to problems that exist at the XYZ Polytechnic
2	The technology needed for implementation is that there must be a problem tracking/resolution system that can overcome problem management	Technology	There needs to be an installation of an application regarding problem tracking and system resolution, i.e., the Backlog application. The Backlog bug tracking software follows a four-step process when solving any software problem: 1) capture, 2) prioritize, 3) track, and 4) release.

IV. CONCLUSION

Based on the main problems, XYZ Polytechnic encourages digital transformation, especially in reconstructing adaptive and responsive policies and developing structured governance with information systems using COBIT 2019 as the solution offered to produce a governance design for XYZ Polytechnic guidelines. After doing the research, the creation of the governance system for XYZ Polytechnic is as follows: Two governance and management objectives must improve to capability level 2, EDM02 and DSS06. Eight governance and management objectives need to improve to capability level 3. The objectives are EDM04, APO08, APO11, APO13, BAI01, BAI05, BAI10, and BAI11. Seven governance and management objectives need to improve to capability level 4.

The objectives are BAI02, BAI03, BAI04, BAI06, BAI07, BAI08, and DSS03.

Based on the capability assessment and gap analysis results, recommendations were made for XYZ Polytechnic, as discussed in the previous section. The recommendations act as evaluation material to improve organizational performance by providing good smart campus governance services to students and internal members of XYZ Polytechnic.

REFERENCES

- [1] M. A. Ghufron, "Revolusi Industri 4.0: Tantangan, Peluang, Dan Solusi Bagi Dunia Pendidikan," *Seminar Nasional dan Diskusi Panel Multidisiplin Hasil Penelitian dan Pengabdian Kepada Masyarakat 2018*, vol. 1, no. 1, 2018.
- [2] M. Adhisyanda Aditya, R. Dicky Mulyana, and A. Mulyawan, "Perbandingan COBIT 2019 dan ITIL V4 Sebagai Panduan Tata Kelola dan Management IT," *Jurnal Computech & Bisnis*, vol. 13, no. 2, 2019.
- [3] S. K. White, "What is COBIT? A framework for Alignment and Governance," *Cio*. 2019.
- [4] D. Steuperaert, "COBIT 2019: A significant update," *EDPACS*, vol. 59, no. 1, 2019, doi: 10.1080/07366981.2019.1578474.
- [5] M. Ikhsan, A. P. Widodo, and K. Adi, "Systematic Literature Review on Corporate Information Technology Governance in Indonesia using Cobit 2019," *Prisma Sains: Jurnal Pengkajian Ilmu dan Pembelajaran Matematika dan IPA IKIP Mataram*, vol. 9, no. 2, 2021, doi: 10.33394/j-ps.v9i2.4370.
- [6] ISACA, *COBIT 2019 Framework. Introduction and Methodology*. 2018.
- [7] A. Gerl, M. von der Heyde, R. Grob, R. Seck, and L. Watkowski, "Applying COBIT 2019 to IT Governance in Higher Education," in *Lecture Notes in Informatics (LNI), Proceedings - Series of the Gesellschaft für Informatik (GI)*, 2020, vol. P-307. doi: 10.18420/inf2020_47.
- [8] S. de Haes, W. van Grembergen, A. Joshi, and T. Huygh, "COBIT as a Framework for Enterprise Governance of IT," 2020. doi: 10.1007/978-3-030-25918-1_5.
- [9] G. Braga, "COBIT 2019 and the IIA 2019 Guiding Principles of Corporate Governance," *ISACA Journal*, 2020.
- [10] A. Fernandes, R. Almeida, and M. M. da Silva, "A flexible method for COBIT 2019 process selection," 2020.
- [11] F. Ajismanto and S. Surahmat, "Information Technology Governance Analysis Of Stmik Palcomtech In The New Normal Era Using Cobit 2019 Method," *Journal of Computer Networks, Architecture and High Performance Computing*, vol. 3, no. 2, 2021, doi: 10.47709/cnahpc.v3i2.1097.
- [12] H. M. J. Saputra, A. I. N. F. Abdullah, D. B. Tandirau, E. Ramadhani, and L. H. Atrinawati, "penyesuaian sistem tata kelola pada institut teknologi kalimantan dengan menggunakan cobit 2019," *JSI: Jurnal Sistem Informasi (E-Journal)*, vol. 12, no. 2, 2020, doi: 10.36706/jsi.v12i2.11582.
- [13] M. Saleh, I. Yusuf, and H. Sujaini, "Penerapan Framework COBIT 2019 pada Audit Teknologi Informasi di Politeknik Sambas," *Jurnal Edukasi dan Penelitian Informatika (JEPIN)*, vol. 7, no. 2, 2021, doi: 10.26418/jp.v7i2.48228.
- [14] D. Darmawan and A. F. Wijaya, "Analisis dan Desain Tata Kelola Teknologi Informasi Menggunakan Framework COBIT 2019 pada PT. XYZ," *Journal of Computer and Information Systems Ampera*, vol. 3, no. 1, 2022, doi: 10.51519/journalcisa.v3i1.139.
- [15] A. Wijaya, "An information technology governance audit planning calibration laboratory using cobit 2019," *Jurnal Fasilkom*, vol. 10, no. 3, 2020, doi: 10.37859/jf.v10i3.2272.
- [16] E. Elue, "Effective Capability and Maturity Assessment Using COBIT 2019," *COBIT Focus*, 2020.
- [17] M. A. Saputra and M. R. Redo, "penerapan framework cobit 2019 untuk perancangan tata kelola teknologi informasi pada perguruan tinggi," *Journal of science and social research*, vol. 4, no. 3, 2021, doi: 10.54314/jssr.v4i3.715.
- [18] L. H. Atrinawati *et al.*, "Assessment of Process Capability Level in University XYZ Based on COBIT 2019," in *Journal of Physics: Conference Series*, 2021, vol. 1803, no. 1. doi: 10.1088/1742-6596/1803/1/012033.
- [19] A. M. Fikri, H. S. Priastika, N. Octaraisya, S. Sadriasyah, and L. H. Trinawati, "Rancangan Tata Kelola Teknologi Informasi Menggunakan Framework COBIT 2019 (Studi Kasus: PT XYZ)," *information management for educators and professionals: Journal of Information Management*, vol. 5, no. 1, 2020, doi: 10.51211/imbi.v5i1.1410.
- [20] P. N. Anastasia and L. H. Atrinawati, "Perancangan tata kelola teknologi informasi menggunakan framework cobit 2019 pada hotel XYZ," *JSI: Jurnal Sistem Informasi (E-Journal)*, vol. 12, no. 2, 2020, doi: 10.36706/jsi.v12i2.12329.
- [21] R. S. A. Gusni, K. Kraugusteeliana, and I. W. W. Pradnyana, "Analisis Tata Kelola Keamanan Sistem Informasi Rumah Sakit XYZ Menggunakan Cobit 2019 (Studi Kasus pada Rumah Sakit XYZ)," *Konferensi Nasional Ilmu Komputer (KONIK) 2021*, vol. 2019, no. September, 2021.
- [22] "Perencanaan Tata Kelola Teknologi Informasi Menggunakan Framework Cobit 2019 pada DPMPTSP," *Jurnal Ilmiah Komputasi*, vol. 20, no. 2, 2021, doi: 10.32409/jikstik.20.2.2750.
- [23] K. Wabang, Y. Rahma, A. P. Widodo, and ..., "Tata Kelola Teknologi Informasi Menggunakan Cobit 2019 Pada Psi Universitas Muria Kudus," ... (*Jurnal Teknologi dan ...*), vol. VII, no. 3, 2021.