

Evaluation of Information Technology Governance at XYZ Bondowoso Hospital Using COBIT 2019 and ITIL V4

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Abstract

This study is in the field of information technology (IT) governance. Researchers investigated the implementation of IS/IT in a hospital located in Bondowoso, East Java. The results of the investigation showed that the hospital had implemented IS/IT by general hospital regulations and government policies. However, the IT governance system there is not good; there has been no evaluation process. Thus, the purpose of this study is to evaluate IT governance to determine the quality of their IT services and provide recommendations for improvement. The framework used is COBIT 2019 and ITIL V4. Data collection was carried out by interviewing and distributing questionnaires. Data were analyzed using a design toolkit that includes 10 design factors in COBIT 2019. The results of this study are that 3 management practices must achieve capability targets at level 4, namely BAI02, BAI03, and BAI07. Based on the current conditions, BAI02 and BAI03 have achieved level 3, and BAI07 has achieved level 2, with largely achieved rating criteria. This indicates that there is a gap. This study provides recommendations for actions that need to be taken by hospitals that focus on these 3 management practices. Recommendations are made with reference to COBIT 2019 and ITIL V4.

Keywords: IT Governance, Hospitals, COBIT 2019, Design Factors, ITIL V4, IT Capability Level.

I. INTRODUCTION

Information technology (IT) is a medium for exchanging data that has developed rapidly over time. The role of information technology has a big impact on various industries. Most industries are dependent on information technology, including the hospital industry. All this time, the hospital has had a main business to provide and manage health service facilities and infrastructure for the citizens. The hospital has various health services, such as inpatient, outpatient, emergency, laboratory, radiology, and so on, which are managed by the government or the private sector [1]. To improve these health services, information technology is needed for efficiency, accuracy, and security in managing health information [2]. Information technology is also able to shorten business processes that are too long, so that services can be provided to patients quickly [1]. In recent years, many hospitals have implemented an integrated information system that is used to support good performance in providing health services to the citizens [3].

Hospital Management Information System (HMIS) is an information technology innovation and operational strategy that have a positive impact on achieving the hospital's vision and mission [2]. According to Permenkes Number 82 of 2013, HMIS must be implemented by all hospitals in Indonesia [4]. HMIS is an information system that integrates the entire flow of hospital service processes [5]. The current condition of the implementation of HMIS is not optimal, there are several problems or constraints perceived by users [2]. Users are having difficulty operating HMIS, data entry errors, system security, and unstable networks are often problems [1][5][6]. Previous research also stated that electronic systems in the health sector are vulnerable to various cybersecurity threats, including integrity and falsification of records [7]. Efficient, safe, and accurate management of patient health records is a challenge that must be faced [7]. Besides that, it's challenging for hospitals to meet government regulations [2]. Therefore, HMIS and other information technologies are very important, and their implementation, governance, and management need to be considered.

IT governance is important to control and direct hospitals in achieving their goals and targets through adding value and considering the risks [7]. IT governance connects every process in IT resources and is able to ensure the strategic achievement of hospitals, as well as guarantee transparency, efficiency, and effectiveness in the provision of hospital services [8] [9] [10]. Some studies also state that the healthcare industry needs to implement effective governance to fix data issues, which are a valuable asset in the healthcare sector [11].

IT governance in hospitals can be implemented using a framework, namely the Control Objective for Information and Related Technology (COBIT). COBIT is a comprehensive information technology management framework adopted by many organizations worldwide, and used to bridge the gap between business objectives and risks [10][12]. Another framework that is also used for IT governance is the Information Technology Infrastructure Library (ITIL). ITIL provides effective guidance for IT service management and IT governance [13]. ITIL is able to improve customer satisfaction and increase productivity [14].

Several previous studies conducted an IT governance using COBIT in Hospitals. [1] [8] [10]. The studies assessed the maturity and capability levels of IT processes, then provided recommendations to the IT governance of hospitals. Based on previous studies, this study conducted IT governance at one of the Class C Private General Hospitals in Bondowoso Regency, East Java. In 2023, XYZ Hospital will use HMIS to carry out administrative activities, patient data management, and all types of health service data. However, HMIS at XYZ Hospital has not been running optimally. Based on a brief interview with the hospital director and the head of IT, it was found that the main problems that often occur at XYZ Hospital are human error, frequent data input errors in HMIS, the internet network is often slow, and there are often problems with regulations. These problems disrupt the service processes. In addition, XYZ Hospital does not have standardized IT governance. Evaluation of IT governance in this study used COBIT 2019 and ITIL V4.

COBIT 2019 is the latest version of COBIT, which is more flexible to apply to all focus areas than previous versions of COBIT. COBIT 2019 has a concept of separating the governance area (direction) and the management area (management). In the governance area, the Evaluate, Direct and Monitor (EDM) domain focuses on directing senior management to achieve the company's strategy. On the one hand, in the management area, there are 4 domains, those are: 1) Align, Plan and Organize (APO), focuses on the entire organization, strategy and supporting activities for IT; 2) Build, Acquire and Implement (BAI), focuses on the acquisition and implementation of IT solutions and their integration into business processes; 3) Deliver, Service and Support (DSS), focuses on providing quality information technology to users, including security management and business continuity; 4) Monitor, Evaluate and Assess (MEA), focuses on monitoring, evaluating, and assessing IT performance against internal performance targets, policies, internal control objectives, and external needs [13] [15].

COBIT 2019 explores design factors that influence IT governance, including a workflow for planning a governance system tailored to the enterprise [15]. The design factor assessment is carried out using the design toolkit.

Meanwhile, ITIL V4 is used in this study to complement COBIT 2019, to optimize value in IT asset management, and ensure alignment with organizational strategy. ITIL version 4 is the latest version of ITIL, which is more flexible and integrated for effective governance, and pays attention to customer experience and value flow systems. COBIT and ITIL are strong models, significantly influencing each other, structured guidelines in measuring IT performance success, and providing recommendations regarding actions and aspects that need to be improved by the organization in terms of IT management [17][18]. In previous studies, some researchers had combined COBIT and ITIL in terms of evaluating IT governance in the government sector [15]. The combination of COBIT and ITIL is also used by other studies to determine the main components and success indicators of IT service management in hospital emergency units. [16][17].

However, studies that combine this model are very few, especially in the healthcare sector [18]. Thus, it is an opportunity for researchers to use COBIT and ITIL in evaluating information systems in hospitals, with the hope of adding value to all IT-related activities. In this study, there are 2 (two) research questions used, including 1) how to assess information technology capabilities using COBIT 2019 and ITIL V4; 2) how to give recommendations for improving governance systems using COBIT 2019 and ITIL V4. Furthermore, the researcher collected data. Data collection was carried out through interviews and questionnaires. Evaluation of IT governance is carried out by analyzing 10 design factors using the design toolkit provided by COBIT 2019. Then, the COBIT 2019 process mapping is carried out with ITIL V4, and the process capability level is assessed. This study produces processes that need to be improved, process capability levels, gap analysis, and recommendations for improving the IT governance system. This study is certainly inseparable from the support of top management in the hospital. Thus, it is hoped that the results of the evaluation of IT governance can improve the quality of IT services in the hospital.

II. RESEARCH METHODOLOGY

This study uses a quantitative research method. This method is a method used to identify variables in case studies, observe, and measure information [19]. There are 2 (two) strategies in conducting quantitative research, namely conducting experiments and surveys [19]. This study uses surveys in the form of interviews and questionnaires. Researchers create closed interview questions to identify factors that influence governance design.

The stages of this study follow the methodology flow in Figure 1. The research began by conducting a literature study on relevant previous research that discussed the design and evaluation of IT governance in hospitals. In addition,

researchers reviewed the COBIT 2019 and ITIL V4 frameworks that can be used for IT governance.

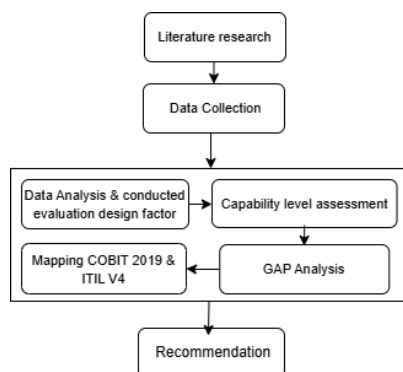


Figure 1. Methodology

The researchers collected data through interviews and questionnaires. Researchers used 4 informants in terms of data collection. These 4 informants were selected based on the level of involvement in the role and organizational structure. The important level of involvement is the Responsible (R) role, which has a role in driving the task. Another important role is Accountable (A), which is responsible for the success of the task. The 4 selected informants are the Director of XYZ Hospital (A), Head of IT (R), and 2 IT Staff (R). The Director and Head of IT are sources for finding out the targets and expectations of XYZ Hospital regarding IS/IT governance. Then, the Head of IT is also a respondent to find out the IT governance process that is currently underway with 2 other IT staff. Interviews were conducted in the form of questions referring to the COBIT 2019 design factor. Interviews were conducted with the Director and Head of IT at XYZ Hospital. Interviews were conducted to obtain information related to the expected conditions. Meanwhile, the questionnaire was in the form of a checklist (Yes) and (No), on each process domain that was later selected. The questionnaire was prepared to find out the respondents' views on the current conditions of the IT process that is running. The questionnaire was addressed to the head of IT and the IT staff at XYZ Hospital. Next, the collected data is analyzed. Researchers examine the answers given by the informants. Then provide an assessment for each design factor in the COBIT 2019 design toolkit. The COBIT 2019 design toolkit has assessment indicators in the form of numbers and percentages. Researchers fill in the design toolkit based on the answers from the informants, which are then reconfirmed with the informants so that the design factor analysis results are as needed. The assessment results in the design toolkit produce the governance and management objectives that are selected to be improved. Meanwhile, the questionnaire data is accumulated to determine the number of IT processes that have been carried out. Furthermore, the governance and management objectives that have been selected are mapped with ITIL V4, to design recommendations that will be prepared.

The target value of the IT capability level can be found in the summary design toolkit. Meanwhile, for the current capability level, it can be seen from the results of the

accumulation or calculation of the number of IT processes that have been running. Based on this value, a GAP was found. There is a difference in the level of process capability between the target and the current condition. Thus, a set of recommendations is prepared that are expected to be used by XYZ Hospital in running the IT governance system, especially HMIS.

III. RESULTS AND DISCUSSION

The collected data is analyzed. The data in this study are interview results with the Director and Head of the IT Department of XYZ Hospital were mapped into the design factor assessment in the COBIT 2019 design toolkit. The design factor can be explained as follows [18]:

1. Enterprise Strategy. Every enterprise has a different strategy. The strategy consists of primary and secondary. The enterprise strategy is defined by COBIT 2019 as follows: a) Growth/Acquisition: the enterprise focuses on revenue growth; b) Innovation/Differentiation: the enterprise focuses on offering different services/product innovation to customers; c) Cost Leadership: the enterprise focuses on minimizing costs in the short term; d) Client Service/Stability: the enterprise focuses on providing stable and client-oriented services.
2. Enterprise Goals. Enterprise Goals support the achievement of Enterprise Strategy. Enterprise goals are arranged based on the dimensions of the Balanced Scorecard (BSC).
3. Risk Profile. The risk profile identifies the types of IT-related risks currently faced by the enterprise.
4. I&T Related Issues. A related method for assessing I&T risk for an enterprise is to consider which I&T-related issues it currently faces.
5. Threat Landscape. 2 (two) threats faced by the enterprise, namely normal threats and high threats.
6. Compliance Requirements. The compliance requirements and demands that must be met by the enterprise are important factors. At this stage, there are 3 types of compliance requirements, namely low, normal, and high.
7. Role of IT. The role of IT in an enterprise is positioned as strategic, support, or factory.
8. Sourcing Model of IT. The implementation of IT in enterprises usually uses IT services models such as outsourcing, cloud, insourced, or hybrid.
9. IT Implementation Methods. There are several types of IT implementation methods, such as Agile, DevOps, Traditional, and Hybrid.
10. Technology Adoption Strategy. There are several types of strategies for adopting new technology. First movers are a strategy for enterprises that want to adopt new technology as soon as possible. Then, followers is a strategy where enterprises wait for others to apply their technology and then follow, and slow adopters is a strategy where enterprises are very slow in adopting new technology.

This section presents the results of the design factor assessment.

1) Design factor 1: Enterprise Strategy

The first design factor is to analyze the organizational strategy implemented by XYZ Hospital. XYZ Hospital has a primary goal of providing quality health services to the community by utilizing information technology. To achieve this goal, XYZ Hospital prioritizes growth/acquisition and innovation/differentiation strategies. This primary strategy is implemented at XYZ Hospital to ensure that business operations are carried out sustainably, there is facility development, and to ensure an increase in service quality. In addition, XYZ Hospital is committed to continuing to develop information technology by following the times. Furthermore, the secondary strategy of XYZ Hospital is client service/stability. XYZ Hospital strives to provide stable services to patients.

Figure 2 is the result of the strategy analysis at XYZ Hospital. The value of revenue growth and innovation has the highest value with a score of 5. This is followed by client service with a score of 4 and cost leadership with a score of 3. The results of the analysis show that XYZ Hospital focuses more on growth/acquisition and innovation/differentiation strategies.

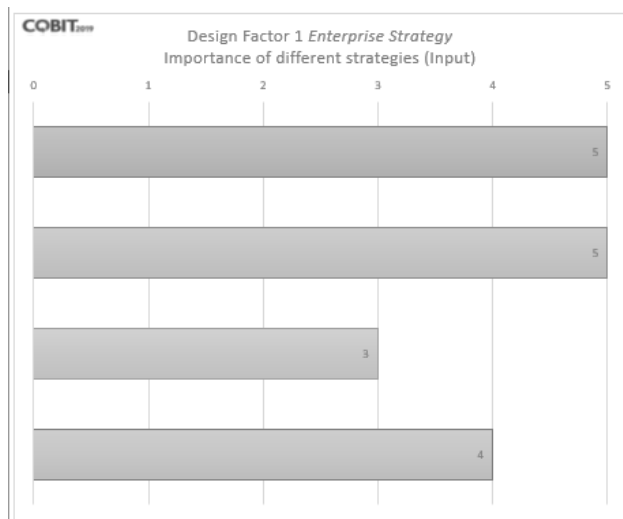


Figure 2. Enterprise Strategy

2) Design factor 2: Enterprise Goals

The enterprise strategy is related to enterprise goals. In COBIT 2019, enterprise goals are mapped using the 4 Balanced Scorecard Perspectives, which consist of: financial, customer, internal process, and learning and growth. Figure 3 is the result of the design factor analysis of XYZ hospital enterprise goals.

Goals related to finance, internal business, and growth have the highest score of 5. These goals are a portfolio of competitive products and services, managed business risk, compliance with external laws and regulations, quality of financial information, optimization of internal management information, optimization of business process costs, managed digital transformation programs, and product and business innovation. There are 8 enterprise goals that can support the

achievement of the enterprise strategy. The eight enterprise goals show that XYZ Hospital needs to observe external environmental conditions, their competitors, observe the needs of the community for health services, follow the development of information technology, develop innovative and superior products and services, and ensure that all government regulations are met. In addition, it also focuses on optimizing information management and business processes at XYZ Hospital. According to the Director, all stakeholders, management, heads of departments, and staff have committed to always being able to adapt to changes that occur in the external environment, as well as internally in the hospital.

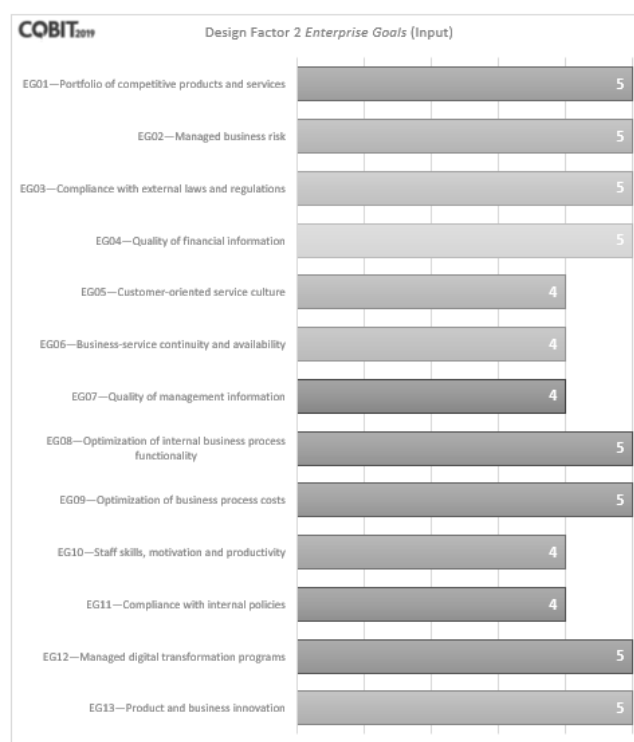


Figure 3. Enterprise Goals

3) Design factor 3: Risk Profile

In Figure 4, the risk profile factor, IT investment decision making, portfolio definition & maintenance have a very high rating, with a score of 16, impact 4, likelihood 4. This risk will have an impact on disrupting all hospital health services.

In addition, the hospital will have financial losses. Other risks that have a very high rating are Enterprise/IT architecture and IT operational infrastructure incidents, both of which have a score of 20, with an impact of 5 and, likelihood of 4. There are also software failures with a very high rating, with an impact of 5 and a likelihood of 5. These three risks will disrupt the running of health services, because services depend on HMIS. If the internet network is slow, the infrastructure is damaged, the system fails, then the service process will be disrupted or cannot run temporarily.

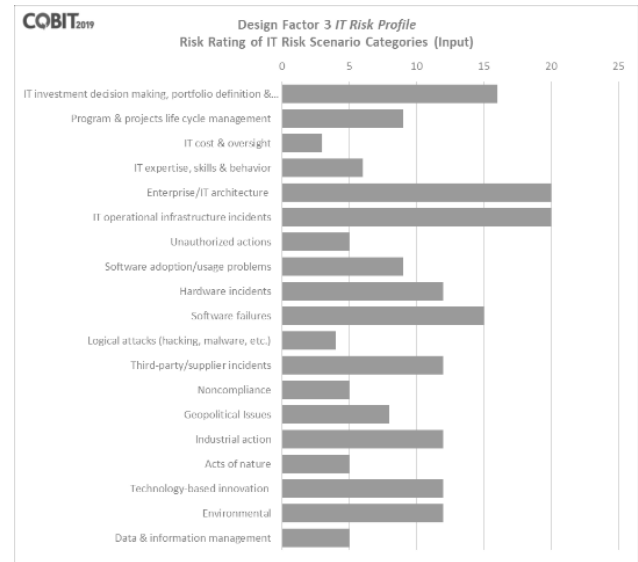


Figure 4. Risk Profile

Several risks are included in high risk, normal risk, and low risk. In this case, very high risk needs is a concern for XYZ Hospital.

4) Design factor 4: IT-Related Issue

Figure 5 shows the problems related to IT, XYZ Hospital has one important problem, which can be categorized as a serious issue, with a score of 3, namely different perceptions between the IT department and the business department regarding business value.

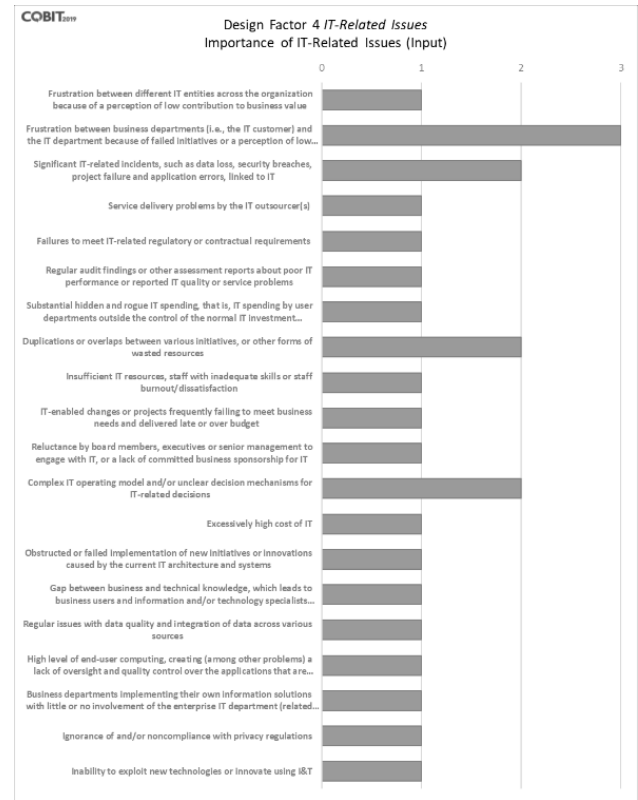


Figure 5. IT Related Issue

Other IT problems are included in the normal issue category, and no issues. The normal issue category with a score of 2 includes: significant IT-related incidents, such as application errors, duplication or overlap between various initiatives, complex IT operating models, and/or unclear IT-related decision-making mechanisms.

5) Design factor 5: Threat Landscape

In the threat landscape factor, there are 2 assessment categories, namely normal and high. The IT threat landscape at XYZ Hospital with a normal category is worth 90%, while 10% is for the high category. This shows that XYZ Hospital is not in external environmental problems, such as problems with its competitors and geopolitical problems.

6) Design factor 6: Compliance Requirements

In the compliance requirements factor, XYZ Hospital has a normal compliance of 80%, because XYZ Hospital has followed the standard hospital rules and the Ministry of Health. As for high compliance of 10%, if there is a new policy from the government, for example, HMIS needs to be integrated with other health applications. So, XYZ Hospital always tries to fulfill the policy. For low compliance of 10%, because XYZ Hospital also follows other general regulations, such as the constitution.

7) Design factor 7: Role of TI

The role of IT in XYZ Hospital can be mapped into 4 categories, namely strategic, turnaround, factory, and support (see Figure 6). IT acts as a factory, with a score of 5. Because if IT fails, it will impact the continuity of business processes and hospital services. The delivery of health services to patients can be disrupted, piling up queues, which will end in bad comments from patients.

Furthermore, the role of IT as support has a score of 4. This is because if IT fails, patient services can still be provided, only the recording is done manually, or is not systematic, for a while. The role of IT as a turnaround only has a score of 3, and strategic only 1, because without IT, patient services can still be provided.

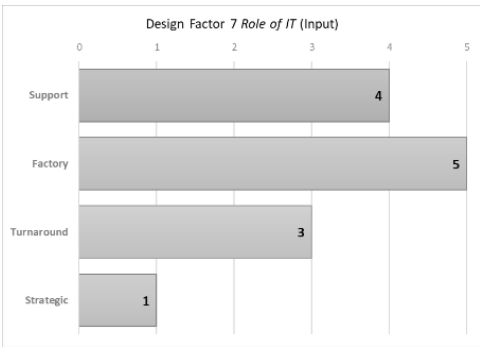


Figure 6. Role of IT

8) Design factor 8: Sourcing model for IT

XYZ Hospital chose a 50% cloud model for their information technology, then 40% for the outsourcing model, and only 10% for the insourced model. So far, in the



development of information technology or information systems, HMIS, for example, prefers to use third parties and maximize the use of the cloud to provide services. Meanwhile, the internal IT department at XYZ Hospital carries out more tasks and functions in IT operations, such as troubleshooting hardware, software, and networks.

9) Design factor 9: IT Implementation Methods

XYZ Hospital prefers to implement DevOps and Agile methods. Where XYZ Hospital requires rapid IT development and prioritizes communication and coordination between the development team and the operations team, from planning to the system being ready to be given to users.

10) Design factor 10: Technology Adaptation Strategy

The most important IT adoption strategy implemented is the first mover, with a score of 70%. XYZ Hospital is committed to being able to update new information technology, or the development of new modules in HMIS, and new regulations by the Ministry of Health or the government. Furthermore, followers have a score of 20% and slow adopters 10%, this is because sometimes if there are sudden new regulations or policies from the government regarding system integration, XYZ Hospital needs to see first how the implementation of the system integration is in other hospitals, what are the obstacles or challenges if the new thing is implemented.

Based on the results of the design factor analysis of the COBIT 2019 design toolkit, there are priority levels of governance and management objectives, which can be seen in Figure 7.

The governance and management objectives score can determine the level of capability that must be achieved by the objectives. COBIT 2019 states that every process that gets a score of ≥ 75 indicates that the process has an importance level of at least 75%, so it requires a capability level of 4. Furthermore, processes that get a score of ≥ 50 require a capability level of 3, and processes with a score of ≥ 25 require a capability level of 2. Below a score of 25, it is necessary to achieve a capability level of 1 [15].

The levels and characteristics of process capability can be described as follows [15]:

- Level 0: Lacks basic capabilities, incomplete approach, may or may not meet the process practice objectives
- Level 1: The process lacks achieving its objectives through an incomplete, unorganized set of activities
- Level 2: The process achieves its objectives through the implementation of a complete set of basic activities. The process is categorized as operational
- Level 3: The process achieves its objectives in an organized manner. The process is typically well defined.
- Level 4: The process achieves its objectives, is well defined, and its performance can be measured quantitatively.
- Level 5: The process achieves its objectives, is well defined, its performance is measured, and continuous improvement is made.

The objectives that need to be achieved at the capability level at level 4 become the main priority to be improved or given recommendations. In this case, BAI02, BAI03, and BAI07 are objectives that need to be achieved at level 4 because they get a score of ≥ 75 [18]. In addition, other governance and management objectives are the second priority, which should be at level 3, with a score of ≥ 50 [18], namely BAI01, BAI05, and BAI11. Scores below 50 are considered unimportant, because they are at levels 1 and 2.



Figure 7. Summary Design Toolkit

In this study, only the main priorities are focused on, namely BAI02 - Managed Requirements Definition, BAI03 - Managed Solutions Identification and Build, and BAI07 - Managed IT Change Acceptance and Transitioning. In the next stage, an assessment of the current capability level of the BAI02, BAI03, and BAI07 processes is carried out. The capability level is obtained from the results of the questionnaire (Yes) and (No), which has been filled out by the Head of IT and 2 Staff of IT.

Current IT Capability levels can be expressed by ratings. The rating criteria indicate the level of current IT capabilities. The rating criteria can be explained as follows [18]:

- Fully: Capability level achieved more than 85 percent

- Largely: Capability level achieved between 50 percent and 85 percent.
- Partially: Capability level achieved between 15 percent and 50 percent.
- Not: Capability level achieved is less than 15 percent.

The results of the questionnaire were processed, and the achievement of the process capability level was calculated (See Table 1), so that a GAP was obtained between the target and the current realization of the process capabilities of BAI02, BAI03, and BAI07, which is presented in Table 2.

Table 1. Calculated Current Capability Level

Governance/ Management Process	Level			Capability level
	2	3	4	
BAI02 - Managed Requirements Definition	100% Fully achieved	55% Largely achieved	-	Level 3
BAI03 - Managed Solutions Identification and Build	80% Fully achieved	65% Largely achieved	-	Level 3
BAI07 - Managed IT Change Acceptance and Transitioning.	60% largely achieved	-	-	Level 2

Table 1. GAP analysis

Governance/ Management Process	Current Capability Level	Target Capability Level	GAP
BAI02 - Managed Requirements Definition	3	4	1
BAI03 - Managed Solutions Identification and Build	3	4	1
BAI07 - Managed IT Change Acceptance and Transitioning	2	4	2

In Table 1, it can be explained that the achievement of the capability level for BAI02 and BAI03 is at level 3, and BAI07 is at level 2. The method for calculating the capability level uses the Formula 1:

$$CC = \frac{\sum Cla}{\sum Po} \times 100\% \quad (1)$$

The calculation method is carried out on the questionnaire results for each answer obtained from 3 respondents, then an average is calculated, so that the results of the capability level and rating criteria are obtained.

Where all activities that have been running are divided by the total number of activities and multiplied by 100%. The calculation of level 2 capability in BAI02 and BAI03, respectively, is 100% and 80% with a fully achieved rating, meaning that all processes running at level 2 have been achieved, so they can be continued at level 3. At level 3 capability, BAI02 and BAI03, each is 55% achieved with a largely achieved rating, so both processes stop at level 3 and are not continued at level 4. Furthermore, the calculation of level 2 capability in BAI07 is 60% with a largely achieved rating, meaning that all processes running at level 2 have not been fully achieved, so they do not need to be continued at level 3.

In Table 2, the capability level is presented, and the capability GAP of each process can be seen. The largest GAP is BAI07, then continued with BAI02 and BAI03. Furthermore, each process is mapped in ITIL version 4. ITIL can complement COBIT by recommending aspects that need to be improved in terms of IT management. The management objectives in COBIT 2019 can be mapped with the management practices in ITIL V4, as follows:

Table 2. Mapping COBIT 2019 and ITIL V4

COBIT 2019	ITIL V4
BAI02 - Managed Requirements Definition	General management practice 5.1.10 Risk Management Service management practice 5.2.2 Business Analysis
BAI03 - Managed Solutions Identification and Build	Service management practice 5.2.10 Service catalogue management 5.2.11 Service configuration management Technical management practice 5.3.1 Deployment management 5.3.2 Infrastructure and platform management 5.3.3 Software development and management
BAI07 - Managed IT Change Acceptance and Transitioning	General management practice 5.1.6 Organizational change management Service management practice. 5.2.4 Change control 5.2.9 Release management 5.2.17 Service validation and testing

Based on the mapping in Table 3, the researcher then proposes recommendations for actions that can be taken by XYZ Hospital to improve their IT governance system. The recommendations made using ITIL V4 and COBIT 2019 [15] [19].

BAI02 is a process that focuses on identifying solutions and analyzing needs to ensure that solutions are aligned with

the company's strategy, which includes business processes, applications, information/data, infrastructure, and services. In this process, the recommendations that can be given are as follows [15][19]:

- XYZ Hospital needs to standardize the IS/IT Risk Management process and process control. Standardization can be done using ISO 31000 and ISO 27001/2 standards. In addition, there is a risk calculation method that can be used, namely Failure Mode and Effects Analysis (FMEA).
- XYZ Hospital needs to document the entire IS/IT maintenance process. Documentation can be in the form of policies, regulations, and standard operating procedures for IS/IT maintenance.
- XYZ Hospital needs to document all IS/IT solution development planning. Starting from solution development, scheduling, solution risk analysis, and IS/IT solution feasibility analysis.
- XYZ Hospital needs to conduct business analysis and IT needs, so that it can plan the right IT solution. In addition, it is necessary to prioritize IS/IT solutions. This prioritization can be based on the level of importance of the solution.

Furthermore, BAI03 is a process that focuses on determining the management and maintenance of products and services, which includes design, development, procurement/resources, and partnerships with vendors. Recommendations that can be given to improve this process are as follows. [15] [19] :

- XYZ Hospital needs to have a good and structured product and service catalog document. A good product and service catalog document will make it easier for patients to use their products or services.
- XYZ Hospital needs to standardize all documents related to the IS/IT solution standards.
- XYZ Hospital needs to conduct regular monitoring and evaluation, with the aim that IT-related processes can be improved and can run sustainably. Monitoring and evaluation activities need to be documented.
- XYZ Hospital needs to implement cloud management on every infrastructure and platform.
- The IS/IT solution development team needs to consider aspects related to the user interface, so that it can be understood by users.

Meanwhile, BAI07 is a process that focuses on the acceptance and operation of new solutions, which includes planning, system and data conversion, testing, communication, release preparation, promotion to production of new or changed business processes and I&T services, initial production support, and post-implementation review. The capability level of BAI07 reaches level 2, and the capability target is level 4; the capability GAP in BAI07 is greater than BAI02 and BAI03. In BAI07, RS XYZ has not carried out change management and testing properly, nor documented. Thus, the recommendations that can be given are as follows. [15] [19]:

- XYZ Hospital needs to make improvements and changes to the hospital's IS/IT by analyzing the risks and impacts on the hospital.
- XYZ Hospital needs to implement standardized controls to gain added value and avoid negative impacts on the hospital and patients. Changes need to be classified and prioritized.
- XYZ Hospital needs to record or document all changes properly.
- XYZ Hospital needs to provide training for staff on all changes to IS/IT.
- XYZ Hospital Managers must motivate all staff to truly integrate new work methods into their daily work.
- In developing IS, it is necessary to plan a validation process and well-documented testing.
- XYZ Hospital needs to implement a review mechanism for documented IS/IT changes.

IV. CONCLUSION

XYZ Hospital is one of the hospitals located in Bondowoso, East Java. Since its establishment, this hospital has always tried to follow technological developments in the hope of improving the quality of its services. SIMRS is one of their mainstay information systems, which includes many health services. So far, there have been problems in the implementation of SIMRS, for example, difficulties in operating HMIS, data entry errors, system security, and unstable networks are often obstacles.

Thus, this study conducted the design of the XYZ Hospital IT governance system, so that hospital services can meet patient needs and comply with general rules and government policies. The design of IT governance involves 10 design factors in COBIT 2019, and management practices that need to be improved are found, namely BAI02, BAI03, and BAI07. These three management practices need to reach capability level 4. This study provides recommendations to XYZ Hospital, with the hope that they can be used to improve current health services.

The recommendations are based on COBIT 2019 and ITIL V4. This study is limited to improving the process components running on BAI02, BAI03, and BAI07, not discussing other components, such as organizational structures, people, skills and competencies, policies and procedures, and so on. For further research, this research can be developed by involving other components of COBIT 2019. This research is important to do, because XYZ Hospital has never conducted an IS/IT evaluation or audit process, and there are many undocumented processes.

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