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IT Infrastructure Assessment using the COBIT 2019 Framework

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Abstract— The Admission Office is responsible for student enrollment, and since 2013, the admission process at UIN Sunan Kalijaga has been supported by information technology. To assess the current state of the IT infrastructure in this university, the COBIT 2019 Framework was used. This study identifies five key domains in need of improvement: APO12 (manage risk), which focuses on managing IT-related risks within an organization, BAI10 (manage configuration), to ensure that IT services are delivered efficiently and effectively, DSS02 (manage service requests & incidents), involves the process of providing quick and efficient responses to user requests and handling various incidents, DSS03 (manage problems), to provide timely and effective support to consumers, ensuring their issues are addressed, their needs are met, and DSS04 (manage continuity), to ensure that the organization can respond effectively to incidents and disruptions, minimizing downtime and maintaining business continuity. The results showed that the capability levels for these domains in UIN Sunan Kalijaga were at Level 1, while the target was Level 4, leading to a capability gap of 3. The gap indicates that considerable effort is required to improve and achieve the desired level of maturity, and this research proposes some recommendations to improve the IT infrastructure.

Keywords— admission; capability level; domain focus; IT infrastructure improvement; gap analysis.

1 INTRODUCTION

The integration of information and communication technology (ICT) in higher education is essential to enhance operational efficiency and meet service expectations. UIN Sunan Kalijaga Yogyakarta, a leading Islamic university, has adopted ICT for student admissions since 2013 [1], [2], [3], [4], [5]. Despite this progress, a comprehensive evaluation of the IT infrastructure at the admission office is necessary to ensure that it aligns with the university's strategic goals and provides efficient services. This study uses COBIT 2019 to assess its governance framework and identify gaps in the infrastructure [6], [7], [8], [9].

Along with the necessity to enhance operational efficiency, higher education institutions also face increasing demands for service quality and transparency. Students, staff, and stakeholders now expect fast, accurate, and accessible services, all of which can be efficiently supported using reliable information systems. Consequently, universities must not only adopt information and communication technology but also continuously evaluate and upgrade their systems to meet evolving user expectations and institutional goals [10].

Moreover, the integration of information and communication technology in universities goes beyond administrative purposes. It also plays a crucial role in supporting academic activities, research, collaboration, and community service. The implementation of various digital platforms enables better communication between students and lecturers, easier access to learning resources, and more effective research data management [11]. Therefore, information and communication technology have become a strategic asset that contributes to the overall academic excellence and competitiveness of higher education institutions [12].

Sunan Kalijaga State Islamic University (UIN) Yogyakarta is one of Indonesia's State Islamic Higher Education institutions, with approximately 22,000 students. Each year, UIN Sunan Kalijaga enrolls approximately 6,000 new students from a pool of 60,000 applicants for undergraduate, master's, and doctoral programs. The admission process is the main responsibility of the Admission Office, which is in charge of managing new student admissions. The existing information system application includes modules for registration, Computer-Based Test (CBT), graduation assessment, and student profile data [13].

To face future challenges, an analysis of the information technology infrastructure design at the Admission Office of UIN Sunan Kalijaga is necessary to ensure that business processes can continue to support the university's vision, mission, and strategic plan [14]. This is supported by the role of enterprise architecture in aligning IT strategy and organizational goals [15], [16], [17], [18]. The analysis utilizes the COBIT 2019 Framework [19], which helps formulate IT strategies, define IT processes and their activities, and assess the capability of IT governance and management to achieve optimal performance [20], [21], [22], [23]. COBIT 2019 can align the objectives of developing the Information Technology infrastructure at the Admission Office of UIN Sunan Kalijaga Yogyakarta.

This research aims to identify the capability level and the gaps within the Admission Office of UIN Sunan Kalijaga Yogyakarta. Based on these findings, recommendations will be developed to optimize the current IT infrastructure [24]and serve as a basis for evaluation to enhance performance and deliver better services to the public, especially prospective students of UIN Sunan Kalijaga Yogyakarta.

2 METHOD

The research methodology follows the System Governance Design Workflow outlined in the COBIT 2019 methodology guidebook, which includes planning, data collection, and analysis stages. The planning stage involves identifying relevant domains for evaluation based on COBIT design factors. A questionnaire was distributed to stakeholders, and interviews were conducted to gather in-depth insights. The collected data was analyzed to identify the current capability levels. The capability level is a metric that indicates how successfully a process has been implemented and is performing, ranging from 0 to 5.

The gap calculation is used to assess the difference between the current capability level of a process and the target capability level in the IT infrastructure at the Admission Office. To determine the gap between the current capability level and the target capability level, the following formula is used (1):

$$\text{Gap} = \text{Target Capability Level} - \text{Current Capability Level} \quad \ldots(1)$$

For example, if the target capability level is Level 4 and the current capability level is Level 2, the gap is:

$$\text{Gap} = 4 - 2 = 2$$

This indicates that there are two levels to improve to reach the target capability. The diagram of this research methodology is depicted in Figure 1.

This section explains the research timeline, research design, research procedure in the form of algorithms, pseudocode or other, and data acquisition [25], [26]. References should support the description of the course of research, so the explanation can be accepted scientifically [27], [28].

2.1 Research Planning Stage

The initial step in the research methodology is the research planning stage, which involves identifying problems, conducting environmental observations, and interviewing relevant parties. These observations were carried out to identify the data required for the research. Afterwards, a literature review was conducted to study the methods and steps that were used in the process of identifying capability levels [29], [30].

During the environmental observation process, particular attention was given to internal and external factors that influence the operations of the Admission Office. Internal observations included the study of existing business processes, organizational structure, and IT systems in use,

while external observations focused on external regulations, stakeholder expectations, and technological developments. Interviews were conducted with key personnel to gather insights that might not be captured through observation alone, ensuring that the research addresses actual challenges faced by the institution.

The method used was based on the design factors in the COBIT 2019 Framework [19], [31], [32]. This method involved analyzing each of the COBIT 2019 design factors. The next step was to determine the selected domains within the COBIT 2019 framework according to the defined scope of the research. This stage was the most crucial part of the entire COBIT 2019 process [33]. The activities within the selected domains formed the basis of the questionnaire questions.

In selecting the domains, it was necessary to map the business goals of the Admission Office to the IT-related goals outlined in the COBIT 2019 framework. This mapping process ensured that the selected domains directly support the university's vision and mission. The activities identified within each domain were then broken down into more detailed operational tasks, which formed the foundation for questionnaire development. A strong alignment between selected domains and institutional priorities was crucial for the effectiveness of the later evaluation stages.

The activities from the selected domains were derived from those listed in the COBIT 2019 Framework. The number of activities in each domain may vary, depending on the framework's specifications [1]. After selecting the domains, the next step was to determine the respondents who would serve as the research subjects. The questions regarding the selected domain activities would be directed at the identified list of respondents. The outcome of this process was the collection of activity data.

The final part of the research planning stage was determining the target capability level, which served as a reference for the capability level identification process. The targeted capability level was derived from the domain mapping results, indicating the level that needs to be achieved [20], [34].

In addition to defining the target capability level, it was equally important to ensure that the scope of the research aligns with the strategic objectives of the Admission Office. Proper scope definition helped maintain the relevance of the research findings and ensured that the proposed recommendations could be realistically implemented. Setting a clear boundary for the assessment ensured that efforts were concentrated on the most critical processes that impact the overall performance of the IT governance framework at UIN Sunan Kalijaga.

At this stage, it is essential to ensure that the research scope remains aligned with the organizational priorities of the Admission Office. This alignment allowed for the identification of the most relevant processes and activities to be assessed, ensuring that the outcomes could be directly applied to improve the institution's IT governance. By clearly defining the boundaries of the research, unnecessary areas could be avoided, and focus could be placed on the most critical elements that would drive improvements in the Admission Office's performance.

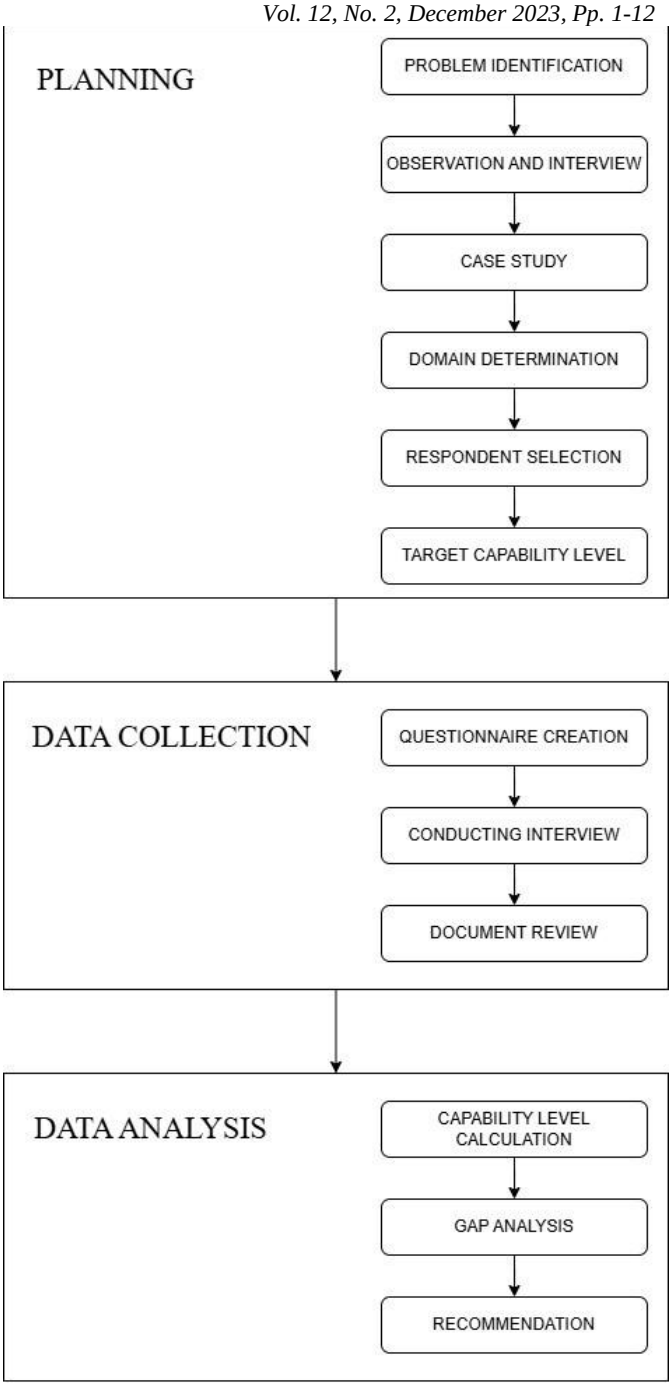

Figure 1. COBIT 2019 Research Methodology

A well-defined scope facilitated resource allocation and ensured that time, budget, and personnel were directed towards the most impactful areas. This allowed for the efficient use of resources and ensured that the research remained feasible and manageable. Proper scope management prevented the research from becoming too broad, which could lead to dilution of focus and a less actionable outcome. In addition, the scope definition should be flexible enough to allow for adjustments based on feedback and new insights that arise during the research.

Moreover, the planning stage must account for any potential risks that could impact the success of the research.

Identifying these risks early, such as delays in data collection, limited availability of respondents, or challenges in defining the scope, helps to develop mitigation strategies. By preparing for these challenges in advance, the research team maintained control over the process and adjusted as necessary to stay on track.

Throughout the planning phase, it was crucial to engage stakeholders actively. Their input, especially during the domain selection and scope definition stages, ensured that the research was relevant and grounded in practical needs. Their involvement also helped build buy-in and support for the research outcomes, making it easier to implement recommendations once the study was completed.

Lastly, the research planning stage should not only focus on identifying the methods and processes but also emphasized the importance of the timing and sequence of each step. A well-structured timeline helped keep the research on schedule, ensuring that each phase was completed within the allocated time frame. It was essential to consider the availability of key personnel and resources when determining the timeline and to avoid any overlap between stages that might cause delays.

By laying out a comprehensive and detailed research planning stage, the foundation was set for a smooth and systematic process that guided the entire research methodology. It ensured that the research yielded actionable results, provided valuable insights, and contributed significantly to enhancing the IT governance framework of the Admission Office at UIN Sunan Kalijaga.

2.2 Data Collection Stage

Following the completion of the research planning phase, the next step involved the data collection stage essential for assessing the current state of IT governance and identifying the maturity level of the organization's processes. The objective of this stage was to gather empirical evidence from relevant stakeholders to form a foundation for analysis and evaluation.

The data collection process was designed to capture a comprehensive understanding of the organization's IT governance landscape, providing a solid foundation for subsequent analysis. This stage was crucial as it formed the empirical backbone of the research, offering valuable insights into the strengths, weaknesses, and gaps within the current IT governance framework.

The first method employed was the distribution of a structured questionnaire to 3 (three) respondents who were directly involved in the management of IT applications. This questionnaire was designed based on COBIT 2019 focus areas and performance management guidelines, and it was administered to selected respondents with a comprehensive understanding of the organization's IT processes. The purpose of the questionnaire was to capture perceptions, practices, and the status of IT governance implementation [35][36].

The distribution of the questionnaire was followed by a period of analysis, where responses were compiled and reviewed for patterns and inconsistencies. This step helped to identify areas of concern or discrepancies that might require further investigation or clarification through follow-up methods such as interviews.

To enhance the accuracy and depth of the data obtained, semi-structured interviews were conducted with key informants: IT managers, system administrators, and 1 personnel who were directly involved in the management of IT applications. Interviews served as a complementary method if the questionnaire responses were incomplete or lacked sufficient detail. Interviews allowed researchers to explore deeper insights and gain contextual understanding that might not be captured through surveys alone [37], [38]. Through these interviews, researchers probed specific areas in more depth, gaining qualitative data that provided nuance and context to the quantitative findings from the questionnaires.

During the interviews, open-ended questions were employed to facilitate a more conversational flow, allowing respondents to elaborate on their experiences and challenges. This provided an opportunity to uncover unanticipated issues or perspectives that might not have been foreseen during the questionnaire design phase. In some cases, follow-up interviews were scheduled to dive deeper into specific topics that emerged from initial discussions.

In addition, a document review was performed on relevant internal reports, IT governance policies, strategic plans, standard operating procedures (SOPs), and previous audit results. This triangulation method ensured the reliability and validity of the collected data. By reviewing these documents, researchers cross-checked the information provided by respondents, ensuring consistency and accuracy across different data sources. Document analysis also helped to understand the historical context of IT governance practices and the evolution of policies, providing a comprehensive view of the organization's IT governance practices.

The document review included both formal and informal sources, such as internal project reports, meeting minutes, and annual IT performance reviews. These documents were carefully examined for insights into the implementation and ongoing management of IT governance, and for any gaps or areas for improvement.

The research was conducted at the Admissions Office of UIN Sunan Kalijaga Yogyakarta by involving stakeholders involved in the formulation, development and maintenance of IT infrastructure. This focused approach ensures that the perspectives of those directly responsible for IT governance and management are captured, providing a more accurate reflection of the current state and highlighting areas for future improvement.

During the data collection phase, special attention was given to ensuring that the sampling process is representative of the various roles within the IT governance landscape. This included individuals from diverse backgrounds and areas of expertise, allowing the research to capture a broad spectrum of insights into IT governance practices. Ensuring diversity in the selection of respondents helped avoid biased perspectives and guaranteed that the research findings reflected a more holistic view of the institution's IT governance framework.

Moreover, while conducting data collection, it was crucial to ensure data privacy and confidentiality. Protecting the

personal information of respondents and handling sensitive organizational data securely were key ethical responsibilities that researchers rigorously adhered to. Clear guidelines were established on how data would be stored, analyzed, and reported, with specific measures in place to protect confidentiality throughout the research process.

In addition to the structured methods of data collection, observational research was conducted to gain real-time insights into the operations and interactions within the IT governance environment. This observational data complemented other research methods by providing an in-situ perspective of the work culture, decision-making processes, and collaboration between teams. Observations uncovered tacit knowledge that was not easily communicated through interviews or documents, allowing researchers to gain a fuller understanding of the organizational dynamics.

Finally, an ongoing review of the data collection process was conducted to ensure that any emerging issues or gaps in the data collection strategy were addressed promptly. This adaptive approach allows for flexibility in the data collection process, ensuring that research remains relevant and responsive to any new challenges or opportunities that might arise. By continuously evaluating and adjusting the data collection process, the researchers ensured that the final dataset was as complete and representative as possible.

In parallel with the structured data collection methods, an important aspect of the process was managing potential biases that arose during data gathering. Biases can emerge in various forms, such as selection bias, where certain stakeholders may be overrepresented or underrepresented, or response bias, where participants may provide socially desirable answers instead of honest feedback. To mitigate these biases, it was important to establish clear and objective criteria for respondent selection and ensure that all participants felt comfortable providing candid responses. Ensuring that the data collection process is as neutral and unbiased as possible enhances the credibility of the research findings.

Another consideration in the data collection stage is the use of technology to streamline the process. Tools such as online survey platforms or automated data aggregation software can efficiently manage and analyze large volumes of responses. These technologies not only help save time but also enhance the accuracy of the data by minimizing human error. However, researchers must remain vigilant to ensure that these tools are used correctly and that the data captured is aligned with the research objectives. Technology can also support the transparency of the process, ensuring that all respondents' inputs are securely stored and easily accessible for analysis.

The inclusion of a diverse set of stakeholders in the data collection process was critical for capturing a comprehensive view of the institution's IT governance practices. This approach recognized that different stakeholders, such as faculty members, administrative staff, IT technicians, and external vendors, might have varying perspectives and experiences with the IT systems in place. By collecting data from a wide range of stakeholders, researchers could avoid the narrow viewpoint that might emerge if only certain groups were consulted, ensuring that the final analysis reflected the full complexity of the IT governance landscape.

Moreover, it was crucial to ensure that the data collection methods were aligned with the organizational context and culture. For instance, the Admissions Office at UIN Sunan Kalijaga might have its own unique set of challenges, operational dynamics, and technological infrastructure that could affect how IT governance practices were perceived and implemented. Therefore, the researchers took these contextual factors into account when designing the data collection instruments and analyzing the data. By aligning the research methods with the specific context, the findings could be more relevant and actionable for the institution.

Once all data had been collected, it was essential to ensure that it was properly documented and organized for subsequent analysis. The quality of the data collection process significantly impacted the integrity of the analysis and the conclusions drawn. Proper data management techniques, such as categorizing responses, tagging relevant themes, and maintaining a clear record of each respondent's input, were critical in enabling the researchers to efficiently analyze and interpret the data. Additionally, maintaining a clear audit trail for the data collection process ensured transparency, allowing stakeholders to trace how conclusions were drawn from the collected data.

3 RESULT AND DISCUSSION

The research identified five key domains for improvement: APO12 (Managing Risk), BAI10 (Managing Configuration), DSS02 (Managing Service Requests & Incidents), DSS03 (Managing Problems), and DSS04 (Managing Continuity). Each of these domains was assessed to be at Capability Level 1, with the target being Capability Level 4 (1 means not important and 5 means very important).

The gap analysis indicated significant improvements were needed to align the IT infrastructure with the university's strategic objectives. Further actions to enhance the IT governance framework and support continuous improvement were recommended.

3.1 Capability Level

After identifying the problems, conducting environmental observations, and interviewing relevant parties, the next step was to determine the domains. This was done through the following steps: analyzing design factors, selecting the appropriate domains, determining the activities within those selected domains, choosing respondents, and setting the target Capability Level.

An analysis of design factors was carried out using the COBIT 2019 Design Toolkit, which required the completion of 10 design factors: enterprise strategy, enterprise goals, risk profile, IT-related issues, threat landscape, compliance requirements, role of IT, sourcing model, IT implementation methods, and technology adoption strategy.

Table 1 shows the results of the first design mapping, namely organizational strategy based on observations obtained from the priority strategy at the admissions of UIN Sunan Kalijaga Yogyakarta, namely providing services to the process of admitting new students.

Table 1. Importance of Each Enterprise Strategy Archetype

Value	Importance (1-5)	Baseline
Growth/Acquisition	1	3
Innovation/Differentiation	1	3
Cost Leadership	1	3
Client Service/Stability	4	3

The second design factor is organizational goals based on the results of observations and interviews. The results obtained are presented in Table 2, where value 1 means not important and value 5 means very important.

Table 2. The Importance of Each Enterprise Goal

Value	Importance (1-5)	Baseline
EG01—Portfolio of competitive products and services	1	3
EG02—Managed business risk	1	3
EG03—Compliance with external laws and regulations	1	3
EG04—Quality of financial information	1	3
EG05—Customer-oriented service culture	4	3
EG06—Business-service continuity and availability	4	3
EG07—Quality of management information	3	3
EG08—Optimization of internal business process functionality	3	3
EG09—Optimization of business process costs	1	3
EG10—Staff skills, motivation and productivity	1	3
EG11—Compliance with internal policies	2	3
EG12—Managing digital transformation programs	1	3
EG13—Product and business innovation	1	3

The third design factor is the Risk factor, which was measured by identifying the risk profile of UIN Sunan Kalijaga Yogyakarta's admissions process. The results are presented in Table 3: the Impact column represents the potential effect of each risk, with values ranging from 1 (no significant effect) to 5 (very influential). The Likelihood column indicates the probability of the issue occurring, with values from 1 (rarely occurs) to 5 (often occurs).

The fourth design factor involves IT-related specifically focusing on identifying problems that may be encountered by the Admission Office of UIN Sunan Kalijaga Yogyakarta, especially in the field of information technology. The observation results are presented in Table 4.

Table 3. The Importance of Each Generic IT Risk Category

Risk Scenario Category	Impact (1-5)	Likelihood (1-5)	Risk Rating	Baseline
IT investment decision making, portfolio definition & maintenance	**1**	**1**	1	*9*
Program & projects life cycle management	**2**	**1**	2	*9*
IT cost & oversight	**1**	**1**	1	*9*
IT expertise, skills & behavior	**1**	**1**	1	*9*
Enterprise/IT architecture	**1**	**1**	1	*9*
IT operational infrastructure incidents	**3**	**2**	6	*9*
Unauthorized actions	**3**	**1**	3	*9*
Software adoption/usage problems	**3**	**2**	6	*9*
Hardware incidents	**3**	**2**	6	*9*
Software failures	**3**	**1**	3	*9*
Logical attacks (hacking, malware, etc.)	**2**	**1**	2	*9*
Third-party/supplier incidents	**1**	**1**	1	*9*
Noncompliance	**1**	**1**	1	*9*
Geopolitical Issues	**1**	**1**	1	*9*
Industrial action	**1**	**1**	1	*9*
Acts of nature	**1**	**1**	1	*9*
Technology-based innovation	**1**	**1**	1	*9*
Environmental	**1**	**1**	1	*9*

Data & information management	**2**	**1**	2	*9*

The fifth design factor is landscape threat. The measurement results are presented in Table 5. Table 5 shows the threat landscape.

The sixth design factor is compliance requirements or compliance with Policy. The measurement results can be seen in Table 6.

Table 4. The Importance of Each Generic IT-Related Issue

IT-Related Issue	Importance (1-3)	Baseline
Frustration between different IT entities across the organization because of a perception of low contribution to business value	1	*2*
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	*2*
Significant IT-related incidents, such as data loss, security breaches, project failure and application errors, linked to IT	1	*2*
Service delivery problems by the IT outsourcer(s)	1	*2*
Failures to meet IT-related regulatory or contractual requirements	1	*2*
Regular audit findings or other assessment reports about poor IT performance or reported IT quality or service problems	1	*2*
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	1	*2*
Duplications or overlaps between various initiatives, or other forms of wasted resources	1	*2*
Insufficient IT resources, staff with inadequate skills or staff burnout/dissatisfaction	2	*2*
IT-enabled changes or projects frequently failing to meet business needs and delivered late or over budget	1	*2*
Reluctance by board members, executives or senior management to engage with IT, or a lack of committed business sponsorship for IT	1	*2*
Complex IT operating model and/or unclear decision mechanisms for IT-related decisions	1	*2*
Excessively high cost of IT	1	*2*
Obstructed or failed implementation of new initiatives or innovations caused by the current IT architecture and systems	2	*2*
Gap between business and technical knowledge, which leads to business users and information and/or technology specialists speaking different languages	2	*2*
Regular issues with data quality and integration of data across various sources	1	*2*
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	*2*
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)	1	*2*
Ignorance of and/or noncompliance with privacy regulations	1	*2*
Inability to exploit new technologies or innovate using I&T	1	*2*

The seventh factor is the importance of the significance of IT or the role of the Admission Office within the broader organizational policies, especially the influence of IT. The results of the observation can be seen in Table 7.

The eighth factor is the IT Resource Model, based on observations summarized in Table 8. The ninth factor is the Implementation method, or IT implementation method, assessed through developer activities. The results are presented in Table 9.

The last factor is the Adoption Strategy or technology adoption strategy carried out by the Admissions office. The results of the observation are presented in Table 10.

Table 5. The Importance of Threat Landscape

Value	Importance (100%)	Baseline
High	**30%**	***33%***
Normal	**70%**	***67%***

Table 6. The Importance of Compliance Requirements

Value	Importance (100%)	Baseline
High	0%	**0%**
Normal	20%	**100%**
Low	80%	**0%**

Table 7. The Importance of the Role of IT

Value	Importance (1-5)	Baseline
Support	2	**3**
Factory	4	**3**
Turnaround	1	**3**
Strategic	1	**3**

Table 8. The Importance of Sourcing Model for IT

Value	Importance (100%)	Baseline
Outsourcing	10%	***33%***
Cloud	60%	***33%***
Insourced	30%	***34%***

Table 9. The Importance of IT Implementation Method

Value	Importance (100%)	Baseline
Agile	50%	***15%***
DevOps	30%	***10%***
Traditional	20%	***75%***

Table 10. The Importance of Technology Adoption Strategy

Value	Importance (100%)	Baseline
First mover	0%	**15%**
Follower	30%	**70%**
Slow adopter	70%	**15%**

Figure 2 presents the results of the COBIT 2019 design for the Admissions Office of UIN Sunan Kalijaga Yogyakarta. The governance design produced consists of processes along with their recommended capability levels. COBIT 2019 explains that a capability score of greater than or equal to 80 requires a Capability Level of 4. If the score is greater than or equal to 50, a Capability Level of 3 is required. If the score is greater than or equal to 25, a Capability Level of 2 is needed, and if the score is below 25, the process must reach Capability Level 1. Based on the COBIT 2019 results, the processes that scored greater or equal to 80 and therefore must achieve Capability Level 4 are APO12 with a score of 85, BAI10 with a score of 100, DSS02 with a score of 85, DSS03 with a score of 85, and DSS04 with a score of 85.

After identifying 5 key domains based on the 2019 COBIT design factor, respondents were selected to fill out questionnaires on each domain. In the capability level assessment, respondents were expected to assess the level of activity capability by giving a value of Y for Yes, and T for No, meaning that the activity had not been carried out. The assessment was based on the condition that if the result of the level of capability achieved is less than 15%, it will result in N (Not Achieved), if it is achieved between 15% and 50%, it will result in P (Partially Achieved), if it is achieved between 50% and 85%, it will result in L (Largely Achieved), and if it is achieved more than 85%, it will result in F (Fully Achieved), which if the result is F, it can continue to the next level of capability. If the result does not reach F, then the capability level only stops at that level.

3.2 Gap Measurement

3.2.1 *Capability Level of Domain APO12:* APO12 consists of 6 domains with 36 questions. The results, presented in Table 11, were obtained through interviews with relevant parties to assess Capability Level 2. Based on the responses, the answers were categorized as Y (Yes) and T (No). A subsequent calculation yielded a score of 33%, indicating P (Partially Achieved).

3.2.2 *Capability Level of Domain BAI10:* BAI10 consists of 5 subdomains with 16 questions. The results after conducting interviews with relevant parties at Capability Level 2 were summarized in Table 12. Based on the responses, the answers were categorized as Y (Yes) and T (No). A subsequent calculation yielded a score of 40%, indicating P (Partially Achieved).

3.2.3 *Capability Level of Domain DSS02:* DSS02 consists of 7 subdomains with 25 questions. The results based on interviews with relevant parties to assess

Capability Level 2 are presented in Table 13. Based on the responses, the answers were categorized as Y (Yes) and T (No). A subsequent calculation yielded a score of 60%, indicating L (Largely Achieved).

3.2.4 *Capability Level of Domain DSS03:* DSS03 consists of 5 subdomains with 23 questions. Table 14 presents the result of interviews with relevant parties to assess Capability Level 2. Based on the responses, the answers were categorized as Y (Yes) and T (No). A subsequent calculation yielded a score of 67%, indicating L (Largely Achieved).

3.2.5 *Capability Level of Domain DSS04:* DSS04 consists of 8 subdomains with 41 questions. The results from the interviews with relevant parties to assess Capability Level 2 are shown in Table 15. Based on the responses, the answers were categorized as Y (Yes) and T (No). A subsequent calculation yielded a score of 52%, indicating L (Largely Achieved).

3.3 Gap Measurement Result

Thus, the gap is assessed by comparing the target levels of each domain and the current measurement results at the Admission Office of UIN Sunan Kalijaga Yogyakarta. Table 16 shows the gap.

Table 11. APO12

Number	Subdomain	Level	Answer
1	APO12.01	2	Y
2	APO12.01	2	Y
3	APO12.03	2	T
4	APO12.03	2	T
5	APO12.03	2	T
6	APO12.05	2	T
Percentage			33%

Table 12. BAI10

Number	Subdomain	Level	Answer
1	BAI10.02	2	Y
2	BAI10.03	2	Y
3	BAI10.03	2	T
4	BAI10.03	2	T
5	BAI10.04	2	T
Percentage			40%

Table 13. DSS02

Number	Subdomain	Level	Answer
1	DSS02.02	2	Y
2	DSS02.02	2	Y
3	DSS02.02	2	Y
4	DSS02.03	2	T
5	DSS02.03	2	T
6	DSS02.04	2	Y
7	DSS02.04	2	Y
8	DSS02.04	2	T
9	DSS02.05	2	Y
10	DSS02.05	2	T
11	DSS02.05	2	Y
12	DSS02.05	2	Y
13	DSS02.06	2	Y
14	DSS02.06	2	T
Percentage			60%

Table 14. DSS03

Number	Subdomain	Level	Answer
1	DSS03.01	2	Y
2	DSS03.01	2	Y
3	DSS03.01	2	Y
4	DSS03.01	2	T
5	DSS03.01	2	Y
6	DSS03.01	2	T
7	DSS03.03	2	T
8	DSS03.04	2	Y
9	DSS03.04	2	Y
Percentage			67%

Table 15. DSS04

Number	Subdomain	Level	Answer
1	DSS04.01	2	Y
2	DSS04.01	2	Y
3	DSS04.01	2	Y
4	DSS04.01	2	Y
5	DSS04.02	2	Y
6	DSS04.02	2	T
7	DSS04.02	2	T
8	DSS04.02	2	T
9	DSS04.03	2	Y
10	DSS04.03	2	Y
11	DSS04.03	2	Y
12	DSS04.03	2	T
13	DSS04.03	2	T
14	DSS04.03	2	T
15	DSS04.03	2	Y
16	DSS04.04	2	T
17	DSS04.04	2	T
18	DSS04.04	2	T
19	DSS04.06	2	T
20	DSS04.07	2	T
21	DSS04.07	2	Y
22	DSS04.07	2	Y
23	DSS04.07	2	Y
Percentage			52%

Table 16. Gap

Number	Design Factors:	Target Capability Level	Current Capability Level	GAP
1	APO12—Managing Risk	4	1	3
2	BAI10—Managing Configuration	4	1	3
3	DSS02—Managing Service Requests & Incidents	4	1	3
4	DSS03—Managing Problems	4	1	3
5	DSS04—Managing Continuity	4	1	3

4 CONCLUSION

This research successfully assessed the IT infrastructure condition at the Admissions Office of UIN Sunan Kalijaga Yogyakarta using the COBIT 2019 Framework. The first step involved planning the domains to be used, with the help of the COBIT 2019 Design Toolkit, resulting in 5 domains to be

the focus of the assessment. The next step was to determine the capability targets for each domain. After conducting interviews and analysis, the current capability levels and their gaps were identified.

From these gaps, the necessary improvement steps were identified, particularly for the domains of APO 12 (Managed Risk), BAI10 (Managed Configuration), DSS02 (Managed Service Requests & Incidents), DSS03 (Managed Problems), and DSS03 (Managed Continuity).

The analysis identified capability gaps in five critical domains. Recommendations for addressing these gaps were provided to enhance the overall IT governance framework and improve service delivery for prospective students. Future research could focus on the implementation of the proposed improvements and their impact on the university's operational efficiency.

AUTHOR'S CONTRIBUTION

Author 1 - Lead Researcher & Framework Expert – Responsible for the conceptualization and theoretical foundation of the paper, ensuring COBIT 2019 is accurately applied and interpreted in the assessment. Author 2 - Technical Reviewer & Editor – Ensures the paper's coherence, technical accuracy, and academic quality. Reviews for consistency in methodology, strengthens arguments, and polishes language for publication. Author 3 - Data Collection & Analysis Specialist – Oversees the collection of IT infrastructure data from the Admission Offices, conducts interviews/surveys if applicable, and ensures accurate analysis based on COBIT 2019 principles. Author 4 - Case Study & Report Writer – Focuses on structuring the paper, presenting the case study findings clearly, and aligning them with COBIT 2019's assessment standards. Also plays a key role in drafting key sections, conclusions, and recommendations.

COMPETING INTERESTS

One of the authors of this paper serves as the Head of Admissions at UIN Sunan Kalijaga Yogyakarta. While this role provided valuable insights into the IT infrastructure assessment process, all efforts were made to ensure an objective and unbiased evaluation based on the COBIT 2019 framework. The authors declare no other competing interests that may have influenced the research, analysis, or conclusions presented in this paper.

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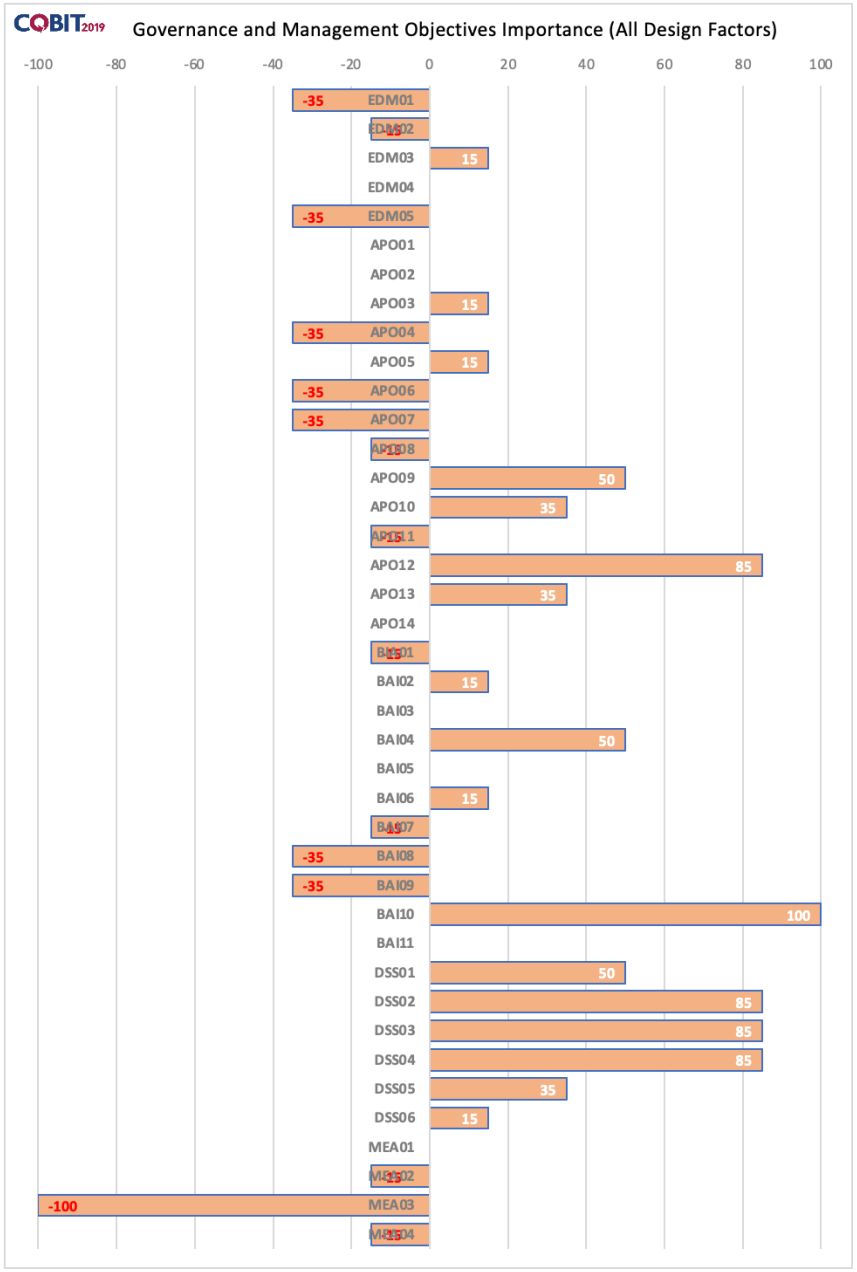

Figure 2.COBIT 2019 Design