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Performance Audit and Management of the SI-MABA Information System for New Student Admissions at Universities Using the Cobit 5 Domain DSS Framework

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Abstract

Information Technology is developing very rapidly, encouraging all aspects of life to be made easier with a system developed with supporting features and functions. Information System Audits are carried out to ensure that the procedures in the agency's existing systems are running properly. Therefore, the author uses the COBIT 5 Framework which is used in auditing the information system. To measure the maturity level of this information system performance, the author uses the COBIT 5 Framework. This research aims to evaluate the implementation of SI-MABA using the capability model determined by COBIT 5.0. This evaluation will provide an overview of the extent to which processes and services related to SI-MABA have been implemented and operated in accordance with the best practices recommended by COBIT 5.0. The results of this evaluation will be illustrated through the Rating Scale determined by the COBIT 5.0 framework, which includes capability levels from 0 (no process) to 5 (optimized process). Thus, this analysis will make it easier to assess SI-MABA's performance and management, as well as identify areas that require improvement and development in the future.

Keywords: Information Technology; Framework; COBIT5; SI-MABA; Audit

1. INTRODUCTION

In this day and age, technology still cannot be fully integrated with various aspects of daily life. Today, progress from the smallest scale has been made based on technology. When information technology is used effectively, it can improve employee morale and increase the overall value of a company in the eyes of customers.[1] Based on this, information technology services must run smoothly and in line with the company's business objectives, in order to achieve the highest level of total power to maintain information technology services. Based on these problems, it is necessary to carry out an audit that covers all aspects of the information technology services provided by the company objectively, systematically and independently and based on the relevant criteria that have been determined.[2] Audits are categorized in various forms, with information systems audits being one of them. An information system audit is an effort to collect and evaluate data to determine the ability of an information system to protect assets.[3] In addition, information technology used in the audit process can ensure data integrity so that business goals can be achieved with existing resources. Thus, an information system audit must be carried out in order to compare business strategies with emerging Information Technology (IT) strategies.

Information Technology (IT), which is developing very rapidly, encourages all aspects of life to be made easier with a system developed with supporting features and functions.[4] One of the current uses of IT is in the academic aspect of an educational institution. The use of IT is always accompanied by IT management which functions as a reference in improving the quality of IT use in an educational institution. The use of IT in the education sector helps teaching staff or lecturers and students in carrying out knowledge transfer or teaching and learning activities, whether using web based, mobile based or both.[5]

Information System Audits are carried out to ensure that the procedures in the agency's existing systems are running properly. Therefore, the author uses the Cobit 5 Framework which is used to audit the information system. Cobit provides a framework guide that can control all organizational activities in detail and clearly so that it can help facilitate decision making at the top level in the agency/organization.[6] In the beginning, information technology was only a complement to the organization's business. As progress progressed, information technology became a very important part of the organization's operations. Organizations utilize IT as something that can be used to support the achievement of the organization's strategic plans and strive to apply IT to realize its vision, mission and goals effectively and efficiently and have high competitive value in facing competition. Information technology governance (IT governance) is a part of organizational governance that explores IT systems and performance and risk management. COBIT 5 helps organizations achieve desired goals and provide added value through effective IT governance and organizational management, has a comprehensive framework.



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Information Technology (IT) is currently a technology that is widely applied by almost all organizations (government, industrial sector, private sector and education). IT governance is part of enterprise governance which consists of leadership and organizational structure and processes.[7] Technology-based information systems are increasingly developing rapidly and are considered as tools to make human work easier. Therefore, the application of the latest technology in various fields is something that is commonly found.[8] Evaluation of information system work performance is important to ensure that the system operates effectively, efficiently, and supports business goals.[9]

The use of information technology is very helpful in activities that support the academic administration process for all stakeholders in the tertiary institution environment. It is hoped that all technology users will be involved in making it easier to obtain information.[10] The high hopes for the information system used are definitely that it is a good system and functions according to everyone's expectations, but the existing expectations and reality are sometimes different or do not match everyone's expectations.[11] Information technology governance is an important foundation in modern organizational management that not only regulates the use of information technology (IT) is considered capable of helping to increase the efficiency of business activities that take place in an organization so that IT is widely used by most organizations.[12] One of the key aspects of this governance is its ability to monitor and evaluate the organization's achievement of predetermined standards. This standard covers various metrics such as IT service quality, data security, operational efficiency, and level of technological innovation. Research conducted at a university in Purwokerto implemented Cobit 5, which is an evolution of the previous version. Cobit 5 has five basic principles which are the basis for IT governance and management in companies or agencies, namely Audit, Control, Management, IT Governance and Corporate IT Governance.



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2. RESEARCH METHODOLOGY

The research method is a series of steps carried out by researchers to collect information and data and conduct research on the data obtained. Research methods describe how research will be carried out, including the procedures and steps that need to be carried out, the duration of the research, the data sources that will be used, as well as methods for collecting, processing and analyzing data.[13]

2.1 Research Stages

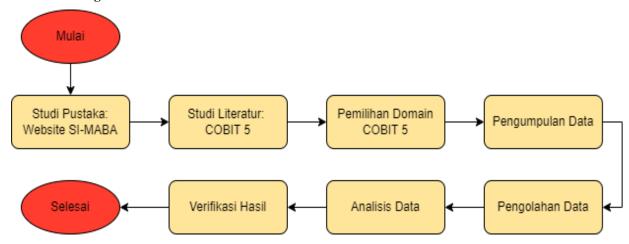


Figure 1. Research Stages

In this research, a research stage is required that must be followed to achieve the research objectives. As in the picture above are the steps used. The following is an explanation of the research stages, namely:

- 1. Literature Study: this is the first stage in this research. At this stage, the author explores all information related to the object being studied to achieve the research objectives. In this research, the author chose a *Website* SI-MABA.
- 2. Literature Study: at this stage, the author uses *Framework* COBIT 5 for research.
- 3. Domain Selection: The author chooses the domain to be used according to the research object. The domains chosen are Domains DSS01, DSS02, DSS04, and DSS05.
- 4. Data Collection: Data collection process in the form of observations and interviews. Observations are carried out by observing a system that is the object of this research. The object being observed is *Website* SI-MABA WINSU. *Website* SI-MABA is *Website* which was accessed by New Students of the North Sumatra State Islamic University. *Website* This aims to make it easier for new students to get the UKT (Single Tuition Fee) which they will pay later each semester. *Website* This also makes it easier for students to submit a UKT appeal if the UKT is not available or is too expensive. Interviews were conducted with users who accessed it *Website* SI-MABA is a New Student at UINSU. Interviews were conducted to obtain accurate information regarding the working procedures of the object under study.
- 5. Data Processing: The results of the data that have been collected from observations and interviews are quantitative and then adjusted to the DSS domain *Checklist* from *assessment tool template COBIT 5* from ISACA.[14]
- 6. Data Analysis: The data analysis process is carried out after data processing. The data analysis carried out consisted of: *Management Awareness*, Current capacity analysis (*As Is*), Expected capacity level (*to be*), and gap analysis (*gap analysis*).[15]
- 7. Result Verification: after data analysis is carried out, the data verification process is carried out regarding the resulting facts and determines the level *Website*.[16]



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2.2 COBIT 5 ISACA



Figure 2. Cobit 5 logo

COBIT is a framework and supporting tools that enable managers to bridge gaps regarding control requirements, technical issues, business risks, and communicate the level of control to each stakeholder. COBIT was first developed in 1996 by the IT Governance Institute (ITGI), part of the Information Systems Audit and Control Association (ISACA).[17]

The COBIT 5 domain that the author will use is DSS (Deliver, Service, and Support). The choice of this domain is in accordance with the direction of Governance and Management on the SI-MABA UINSU Website. The DSS domain was chosen because of its focus on IT delivery and services. These domains can then also support existing business processes and ensure that they are maintained. DSS domains have a mapping process that is run to determine which DSS domain processes can be included in audit activities. This domain is the core of the working procedures of the SI-MABA UINSU Website. DSS (Deliver, Service, and Support) consists of 6 processes, namely DSS01, DSS02, DSS03, DSS04, DSS05, AND DSS06. However, here the author will only use 4 processes from this domain, adjusted to the work of the website. The processes used are DSS01, DSS02, DSS04, and DSS05.[18]

- 1. DSS01: *Manage Operations*. Coordinate and implement operational activities and procedures necessary to provide internal and IT services *outsourcing*, including the implementation of established standard operating procedures and necessary monitoring authorities.[19]
- 2. DSS02: *Manage service requests and incidents*. Respond to user inquiries in a timely and effective manner and resolve all types of incidents.[20]
- 3. DSS04: *Manage Continuity*. Identify and categorize problems and root causes of problems, ensure timely resolution to prevent recurrence of incidents, and make recommendations for improvement.[21]
- 4. DSS05: *Manage Security Service*. Protect company information in accordance with security policies to maintain an acceptable level of information security risk for the company.[21]

The level of process capability used in process evaluation consists of six levels. The entire process with skill levels consists of 6 levels, from level 0 to level 5.[20]

- 1. Level 0: *Incomplete Process*. Namely a process that is not in place or does not achieve its process goals. And here there is little or no evidence that the process objectives are systematically achieved.[20]
- 2. Level 1: Performed Process. Implement existing processes and achieve objectives.[21]
- 3. Level 2: *Managed Process*. A process in which the performance of an activity or process is carried out according to arrangements such as planning, monitoring and evaluation, after which the results of the work product of the process are determined, controlled and maintained.[19]
- 4. Level 3: *Established Process*. Level 2 processes are implemented using predetermined processes that enable process results to be achieved.[20]
- 5. Level 4: *Predictable Process*. Level 3 A process is implemented in accordance with specified process constraints that enable the achievement of process results.[21]
- 6. Level 5: *Optimizing Process*. Level 4 processes are improved in appropriate ways that enable the achievement of current and future business objectives.[21]



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3. RESULTS AND DISCUSSION

The application of the COBIT 5.0 framework to the performance audit and management of the SI-MABA information system at the State Islamic University of North Sumatra focuses on the Deliver, Service and Support (DSS) domain. The DSS domain in the COBIT 5.0 framework includes various processes related to the delivery of IT services, technical support, and maintenance of the IT infrastructure required to support business operations. By implementing COBIT 5.0, especially in this domain, universities can ensure that the SI-MABA information system functions efficiently and effectively, supports user needs, and complies with established policies and standards. COBIT 5.0 provides a comprehensive structure for managing and controlling information and technology that supports business processes, thereby enabling universities to achieve their strategic goals.

This research aims to evaluate the implementation of SI-MABA using the capability model specified by COBIT 5.0. This evaluation will provide an overview of the extent to which processes and services related to SI-MABA have been implemented and operated in accordance with the best practices recommended by COBIT 5.0. The results of this evaluation will be illustrated through the Rating Scale determined by the COBIT 5.0 framework, which includes capability levels from 0 (no process) to 5 (optimized process). Thus, this analysis will make it easier to assess SI-MABA's performance and management, as well as identify areas that require improvement and development in the future. Identifying these needs and improvements is very important to ensure that the information system continues to develop and is able to optimally support the university's academic and administrative goals.

This DSS domain covers various important aspects such as service delivery, technical support, incident management, fulfilling service requests, and maintaining information systems. By using specific questions from this domain, research can thoroughly evaluate how the SI-MABA information system is managed and supported. This approach ensures that every key aspect of service delivery and information systems support is assessed comprehensively, providing a clear picture of current performance.

In this research, capability is used as a measuring tool to assess responses from sources and interviewees. The questions asked in the interview were prepared based on the COBIT 5.0 framework, specifically from the Deliver, Service and Support (DSS) domain, namely:

- a. *Manage Operations* (DSS01). DSS01 covers the coordination and implementation of activities and operational procedures required to provide services to internal and external parties, including monitoring the implementation of standard operational procedures. This process consists of five sub-processes, namely incident management, problem management, service request management, operational performance monitoring and reporting, and operational infrastructure management. By effectively managing operations through these sub-processes, organizations can ensure high-quality service, operational efficiency, and user satisfaction.
- b. *Manage Service Requests and Incidents* (DSS02). DSS02 focuses on providing fast and effective responses to user requests as well as various types of incidents. This process includes post-incident recovery by recording, investigating, diagnosing and resolving the incident. There are seven sub-processes in DSS02, each designed to ensure that each incident is handled properly from start to finish.
- c. *Manage Continuity* (DSS04). DSS04 involves developing and maintaining business and IT plans to respond to incidents and disruptions, to ensure the continued operation of business processes and maintain information availability at a level acceptable to the enterprise. This process includes eight sub-processes designed to ensure that the business can continue to run smoothly despite disruptions.
- d. *Manage Security Services* (*DSS05*). DSS05 aims to protect company information to keep information security risks at a minimum level in accordance with security policies. This includes developing and maintaining information security roles and access rights, and performing security monitoring. This process consists of seven sub-processes designed to ensure comprehensive and effective information security.

Data collection was carried out by conducting interviews with related parties, using questions structured in accordance with COBIT 5.0 principles, such as Manage Operations (DSS01), Manage Service Requests and Incidents (DSS02), Manage Continuity (DSS04), and Manage Security Services (DSS05). The results of this interview will be evaluated using the COBIT 5.0 rating scale assessment framework.



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3.1 Rating Scale

- a. N Not Achieved. There is little or no evidence of achievement of the attributes specified in the process being assessed.
- b. P Partially Achieved. There is some evidence of the approach and some achievement of the attributes specified in the process being assessed. Some aspects of attribute achievement may be unpredictable.
- c. L Largely Achieved. There is evidence of a systematic approach and significant achievement of the attributes set in the processes assessed. Some weaknesses related to these attributes may exist in the process being assessed.
- d. F Fully Achieved. There is evidence of a complete and systematic approach and full achievement of the attributes set out in the process being assessed. There were no significant weaknesses associated with this attribute in the processes assessed.

Table 2. Rating Scale Framework COBIT 5.0

RATING LEVELS						
Abbreviation	Description	% Achieved				
N	Not Achieved	0 to 15% achievement				
P	Partially Achieved	>15% to 50% achievement				
L	Largely Achieved	>50% to 85% achievement				
F	Fully Achieved	>85% to 100% achievement				

3.2 Capability Level in the SI-MABA System

a. DSS01 Capability Level Calculation Results

The capability level assessment in the DSS (Deliver, Service, and Support) Domain will be carried out on four selected processes which cover various important aspects of operational management. One of the processes to focus on is DSS01: Manage Operations. This process focuses on coordinating project implementation and operational procedures necessary to provide services to the organization, both internal and external. This includes implementing standard operating procedures (SOPs) that ensure every operational step is carried out with consistency and in accordance with established standards.

In the context of information systems audits for new students, DSS01 becomes very relevant. This process emphasizes the importance of effective coordination in project implementation, which includes the reception and orientation of new students, managing their data, as well as providing the required IT services. Compliance with established operating procedures is crucial to ensure that every aspect of the services provided runs well and consistently, so that the entire new student community can feel the benefits.

Evaluation of capability level in DSS01 will include an assessment of how operational procedures are implemented and carried out, as well as how well coordination is carried out between the various departments and teams involved. This includes assessing the effectiveness of communications, compliance with SOPs, as well as the ability to overcome problems that arise during the implementation of operations. The results of this evaluation will provide an overview of the organization's level of capability in managing operations and providing quality services to new students, as well as identifying areas that need to be improved to achieve a higher level of capability. The results of the capability level in Domain DSS01 are explained in Table 3 .

Table 3. Capability Level DSS01

Dago1	Level	Level	Le	vel	Le	vel	Le	vel	Le	vel
DSS01	0	1	2	2		3	4	4	4	5
[Manage			Well							
Operation]			2.1	2.2	3.1	3.2	4.1	4.2	5.1	5.2
Rating	F	F	F	F	F	F	F	F	L	



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The Capability Level results in DSS01 reach level 5 (Optimizing Process) because at level 5 you get Largely Achieved status with these results, you have reached a very good process level and cannot be continued to level 5 with Fully Achieved status.

b. DSS02 Capability Level Calculation Results

Domain DSS02: Manage Service Requests and Incidents focuses on providing a fast and efficient response to all user requests when they encounter problems, as well as recovering from incidents through a systematic process of documentation, investigation, diagnosis and resolution. This process is very relevant in the context of auditing information systems used by new students. The goal is to ensure that all service requests or incidents that occur can be resolved effectively. Reliable and responsive information systems are critical to the new student experience, and handling requests and incidents quickly and efficiently increases user confidence in existing systems.

Good documentation allows IT teams to thoroughly investigate incidents, find the root cause of the problem, and perform proper diagnosis. With a deep understanding of the root causes, organizations can implement appropriate preventive measures to prevent the same problem from recurring in the future. Incident resolution carried out in accordance with established procedures ensures that each step is taken carefully and in accordance with existing standards. This not only helps in recovery from problems that occur, but also contributes to improving the performance of information systems used by new students.

Additionally, effective handling of service requests and incidents contributes to increased user satisfaction. By ensuring that all issues are resolved quickly and appropriately, and that users get the help they need in a short time, user satisfaction levels will increase. Capability level evaluations in DSS02 provide insight into an organization's ability to handle service requests and incidents effectively, including assessments of speed of response, accuracy of diagnosis, and effectiveness of problem resolution. Identification of areas that require improvement helps organizations to continue to improve their performance in managing service requests and incidents, supporting the goal of providing reliable and responsive information system services for all new students. The capability level results in the DSS02 Domain are explained in Table 4.

Table 4. Capability Level DSS02

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DSS02	Level	Level	Level		Level		Level		Level	
	0	1	2	2	-	3	2	4		5
[Manage			Well	Well	Well	Well	Well	Well	Well	Well
Service Requests and			2.1	2.2	3.1	3.2	4.1	4.2	5.1	5.2
Incidents] Rating	F	F	F	F	F	F	P			

The Capability Level results in DSS02 reach level 4 (Predictable Process) because at level 5 you get Partially Achieved status with these results, the process is not continued to level 5.

c. DSS04 Capability Level Calculation Results

Domain DSS04: Manage Continuity focuses on efforts to create and maintain business and IT plans will be used in response to incidents and challenges, with the aim of ensuring smooth business processes. This process includes the development of a comprehensive sustainability plan, which includes risk analysis, identification of potential threats, and implementation of effective mitigation strategies. By having a good plan, organizations can ensure that business operations continue to run even if unexpected incidents occur. This includes establishing emergency action guidelines, recovery procedures, and appropriate resource allocation to ensure that every part of business operations can return to normal as quickly as possible after an incident occurs.

In the context of auditing information systems used by new students, DSS04 becomes very crucial. The importance of integrating sustainability plans with information systems cannot be overstated, as disruptions to these systems can have a significant impact on the student learning experience. Information system audits aim to ensure that an effective sustainability plan has been implemented and is properly integrated into the information system. This includes assessing the system's readiness to deal with incidents, such as technical failures, cyber attacks, or natural disasters. With a solid



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plan, organizations can respond quickly and appropriately to incidents, minimize negative impacts, and ensure that services to new students continue without a hitch. Evaluation of capability level in DSS04 will provide an overview of the organization's readiness to maintain operational continuity and continuity of quality services for the entire student community. The capability level results in the DSS04 Domain are explained in Table 5.

Table 5. Capability Level DSS04

DSS04	Level	Level	Le	vel	Le	vel	Le	vel	Le	vel
	0	1	2		3		4		5	
[Manage Continuity			Well 2.1	Well 2.2	Well 3.1	Well	Well 4.1	Well 4.2	Well 5.1	Well 5.2
]			2.1	2.2	3.1	3.2	4.1	4.2	3.1	3.2
Rating	F	F	F	F	F	F	F	L		

The Capability Level results in DSS04 reached level 4 (Predictable Process) because at level 5 you got Largely Achieved status with these results, so the process was not continued to level 5.

d. Result of DSS05 Capability Level Calculation

Domain DSS05: Manage Security Services focuses on maintaining the security of company data to reduce risks to information security and ensure compliance with applicable security regulations. This process includes creating, maintaining, and monitoring an effective security system to protect data from internal and external threats. Managing information security roles as well as controlling access permissions is an important part of this effort, ensuring that only authorized individuals can access sensitive information. This strategy involves the use of advanced technologies such as data encryption, firewalls, and intrusion detection systems, as well as implementing strict security policies and training employees on best security practices.

In the context of auditing information systems used by new students, focusing on Domain DSS05 becomes very important. This audit aims to ensure that the implementation of security policies is in accordance with applicable standards, in order to maintain data integrity and meet the necessary confidentiality requirements. New students' use of information systems often involves sensitive personal data, such as identity, financial, and academic information. Therefore, ensuring that this data is protected from unauthorized access and potential breaches is a top priority. Evaluation of the capability level in DSS05 will provide insight into the effectiveness of the security policies and procedures implemented, as well as identify areas that require improvement to ensure that student data remains safe and secure. The capability level results in the DSS05 Domain are explained in Table 6.

Table 6. Capability Level DSS05

DSS05	Level	Level	Level 2		Level 3		Level 4		Level 5	
	0	1								
[Manage Security			Well	Well	Well	Well	Well	Well	Well	Well
Services]			2.1	2.2	3.1	3.2	4.1	4.2	5.1	5.2
Rating	F	F	F	F	F	F	P			

The Capability Level results in DSS05 reach level 4 (Predictable Process) because at level 5 you get Partially Achieved status with these results, the process is not continued to level 5.

3.3 Result of Capability Level Calculation on DSS Domain

According to the results of evaluation calculations for the DSS domain, the capability level achieved by the SI-MABA Information System at the State Islamic University of North Sumatra is obtained, as shown in Table 7.



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PROCESS	NOW LEVEL	FINAL ACHIEVEMENT	CAPABILITY MODEL LEVELS
DSS01	Level 5: Largely Achieved	Level 4	Optimizing Process
DSS02	Level 4 : Partially Achieved	Level 3	Predictable Process
DSS04	Level 4 : Largely Achieved	Level 4	Predictable Process
DSS05	Level 4 : Partially Achieved	Level 3	Predictable Process

The graph of the results of measuring capability levels using the Deliver, Service and Support (DSS) domain process which is an audit of SI-MABA performance and management at the State Islamic University of North Sumatra, can be seen in Figure 3.

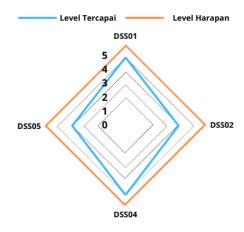


Figure 3. DSS Process Capability Level Graph

The results of the performance and management audit of the SI-MABA information system at the State Islamic University of North Sumatra (UIN North Sumatra) using the COBIT 5.0 framework capability model show that the Manage operations (DSS01) and Manage continuity (DSS04) processes have reached level 4. This means that UIN North Sumatra has excellent operational procedures in providing services to new students and ensuring the continuity of its operations. The Manage security services (DSS05) and Manage service requests and incidents (DSS02) processes are at level 3, indicating that the university has built a strong foundation for information service security and handling requests and incidents as they arise. This reflects the university's commitment to maintaining data security and quick response to problems faced by new students.

However, there is a need to continue to improve information technology services and support to meet the increasingly high expectations of new students. Continuous improvements are needed in various aspects, including increasing system responsiveness, developing more sophisticated security procedures, and providing services that are more intuitive and accessible to students. In this way, UIN North Sumatra can ensure that new students get a better and more efficient experience in accessing and using the university information system. This will not only increase student satisfaction, but also strengthen the university's reputation as an institution that is adaptive and proactive in facing information technology challenges.



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4. CONCLUSION

Information System Audits are carried out to ensure that the procedures in the agency's existing systems are running properly. Therefore, the author uses the Cobit 5 Framework which is used to audit the information system. Cobit provides a framework guide that can control all organizational activities in detail and clearly so that it can help facilitate decision making at the top level in the agency/organization. The application of the COBIT 5.0 framework to the performance audit and management of information systems for New Student Admissions at the University focuses on the Deliver, Service and Support (DSS) domain. The DSS domain in the COBIT 5.0 framework includes various processes related to the delivery of IT services, technical support, and maintenance of the IT infrastructure required to support business operations. By implementing COBIT 5.0, especially in this domain, universities can ensure that the New Student Admissions information system functions efficiently and effectively, supports user needs, and complies with established policies and standards. The results of the performance audit and management of the information system for New Student Admissions at the University using the COBIT 5.0 framework capability model show that the Manage operations (DSS01) and Manage continuity (DSS04) processes have reached level 4. This means that the University has very good operational procedures in providing services for new students and ensuring the continuity of its operations. The Manage security services (DSS05) and Manage service requests and incidents (DSS02) processes are at level 3, indicating that the university has built a strong foundation for information service security and handling requests and incidents as they arise. This reflects the university's commitment to maintaining data security and quick response to problems faced by new students. However, there is a need to continue to improve information technology services and support to meet the increasingly high expectations of new students. Continuous improvements are needed in various aspects, including increasing system responsiveness, developing more sophisticated security procedures, and providing services that are more intuitive and accessible to students. In this way, the University can ensure that new students have a better and more efficient experience in accessing and using university information systems. This will not only increase student satisfaction, but also strengthen the university's reputation as an institution that is adaptive and proactive in facing information technology challenges.



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