INFORMATIK

INFORMATIK JOURNAL, Volume 21, No 3, 2025

Information Systems Audit Using the COBIT5 Framework on Academic Information Systems at Alma Ata University

Rachmat Darmawan[1*], Tri Rochmadi[2], Dadang Heksaputra[3], Yanuar Wicaksono[4]

[1]Information Systems, Faculty of Computer and Engineering, Alma Ata University, Jl Brawijaya No 99 Jadan, Tamantirto, Bantul, Special Region of Yogyakarta 55183, Indonesia

Article Info

Article history:

Received Jul 16, 2025
Revised Aug 11, 2025
Accepted Aug 19, 2025

Keywords:

Information System Audit
COBIT5
DSS
Capability level

ABSTRACT

The rapid development of information technology encourages universities to provide fast, effective, and integrated academic services. Alma Ata University has implemented an Academic Information System (SIAKAD) which functions as a service support in the learning process. However, this system is still faced with several obstacles, including constrained access speed when filling in attendance and the occurrence of recurring service interruptions. This research aims to evaluate the capability level of SIAKAD and develop recommendations for improvement based on the results of the audit conducted with the COBIT 5 framework, especially in the Deliver, Service, and Support (DSS) domain. The methodology applied is mixed methods, which combines qualitative and quantitative approaches. The research findings show that the capability of each subdomain is measured at level 4 (Predictable Process), while the desired target is level 5 in each DSS subdomain. Thus, it can be concluded that SIAKAD of Alma Ata University has been operating well and consistently, but requires improvement steps to achieve the expected level 5.

Corresponding Author:

Rachmat Darmawan,
Information Systems, Faculty of Computer and Engineering,
Alma Ata University,
Jl Brawijaya No 99 Jadan, Tamantirto, Bantul, Special Region of Yogyakarta 55183, Indonesia
Email: 213100219@almaata.ac.id

I. INTRODUCTION

The development of technology in the modern era is increasingly rapid and has an impact on various aspects of life, including education[1] . Technological advances allow the replacement of old technology with newer ones, thus encouraging improvements in learning [2] . Universities develop academic information systems to improve the quality of services for the entire academic community. With this system, it is expected to be a solution to various problems to replace the manual administration process with a more efficient mechanism. In this case, the Academic Information System (SIAKAD) plays an important role in improving the quality of education by modernizing the administration and effectiveness of academic processes [3]. Alma Ata University has implemented SIAKAD to support the learning process. However, in its implementation SIAKAD still faces challenges such as several technical obstacles such as slow access in filling attendance and repeated service interruptions. To overcome the problems that often occur, an information system audit is needed to ensure that SIAKAD has been running optimally and in accordance with procedures. Based on information from the Head of CISDT at Alma Ata University, it is known that SIAKAD has never been audited.

Information system audit is a data-based evaluation process conducted by auditors to assess the performance of the system in performing its functions optimally, supporting organizational goals, and using resources efficiently [4]. In conducting an information system audit and capability level assessment of the Academic Information System can be done with COBIT 5. The COBIT framework was designed by ISACA as a guide in managing and supervising information technology. COBIT 5 is a working tool with comprehensive standards designed to support agencies in improving performance, so as to achieve strategic goals and optimize information technology services [5]. COBIT 5 provides Control Objectives to assess IT performance including SIAKAD through various domains . In this study, the DSS domain will be selected because the Academic Information System of Alma Ata University has been operating and will be relevant to the research conducted [6]. The selection of COBIT 5 is based on its wide use in academic research and audit practice, the availability of comprehensive guidelines and the measurement of the validity of the capability level at SIAKAD Alma Ata University.

Previous research on information systems audits using the COBIT 5 DSS domain has been carried out in various educational institutions, such as Stikubank University Semarang, getting research results on the DSS domain showing an average maturity level of 3.89 (level 3) and capability level at level 2 with a gap of 1 towards the target level 3. Recommendations include improving SOPs, staff training, and optimizing infrastructure [7]. Next, research at UPN Veteran Jakarta obtained research results evaluating the capabilities of academic information systems at UPN Veteran Jakarta using COBIT 5, with an average capability level of 2.20 and a gap of 1.80 towards the target level 4. Recommendations include increased monitoring, documentation, and continuous evaluation to improve SIAKAD performance [8]. Harapan Bangsa University, this research uses the DSS domain to get research results that the maturity level of the SIAKAD e-learning system at Harapan Bangsa University has reached level 4, which means that the system operates continuously and in accordance with the planning that has been determined [9]. This study has the aim of measuring the level of capability level and providing recommendations according to the audit findings in the DSS domain of SIAKAD at Alma Ata University using the COBIT 5 framework . With this audit, it is hoped that Alma Ata University can identify problems, improve service quality, and ensure the sustainability of an efficient academic information system.

II. THEORETICAL

A. *Information System Audit*

Information system audit is the process of collecting and examining evidence to assess whether the system is able to safeguard assets, maintain data accuracy, support the realization of organizational goals optimally and ensure efficient use of resources [10]. Information system audits based on the COBIT framework, also known as IT Assurance, not only aim to assess how IT governance is implemented at XYZ University but also play a role in providing useful input to improve future IT management [11]. Information system audits have several objectives, here are the objectives of an information system audit according to Ron Weber in W. W. A. Winarto [12] : (1) Asset Security; (2) Maintain Data Integrity,; (3) System Effectiveness,; (4) System Efficiency.

B. *Academic Information System*

Academic information system is a system that manages data and supports academic processes between students, lecturers and administration. The academic information system plays an important role in supporting the smooth running of lectures. Therefore, academic services need to be provided in a timely, accurate, and in accordance with user needs [13]. Therefore, academic information systems play an important role in supporting academic activities by managing data efficiently. This system ensures timely, accurate, and appropriate academic services, and increases the effectiveness of education delivery through more optimal access to information.

C. *COBIT 5*

COBIT (Control Objectives for Information and Related Technology) is a set of rules for IT management and supervision developed by the Association for Information System Audit and Control (ISACA). COBIT is the latest generation of ISACA guidelines developed based on user experience in various companies in various contexts such as business, information technology, risk, insurance and security industries. COBIT 5 includes five domains and 37 procedures that can be used in conducting audits. This makes COBIT 5 a relevant and comprehensive framework to support the IT audit process because it covers various important aspects of IT utilization [13]. COBIT 5 consists of five domains categorized into governance and management domains. Each domain has a set of processes designed to support the achievement of set objectives. Here are the five domains in COBIT 5[13] : (1) Evaluate, Direct and Monitor (EDM), focuses on strategic governance to ensure the achievement of organizational objectives, increase value, manage risk and optimize resources through evaluating, directing and monitoring IT performance; (2) Align, Plan and Organize (APO), sets the strategic direction of IT and ensures proper design and organization to support business objectives including the development of appropriate strategies, organizational structures and infrastructure; (3) Build, Acquire and Implement (BAI), focuses on providing IT solutions and implementing them into services including development, acquisition, integration, and maintenance of systems to keep them in line with business objectives; (4) Deliver, Service and Support (DSS), focuses on IT service delivery and user support including service management, security, sustainability, operations, and data and infrastructure management; (5) Monitor, Evaluate and Assess (MEA), focuses on periodic evaluation of IT processes to ensure quality, compliance, and effectiveness of governance through performance monitoring, internal controls and regulations.

D. *Deliver, Service and Support*

Deliver, Service and Support (DSS) is a domain in COBIT 5 that focuses on providing information technology services and technical support. This domain includes aspects such as system security, service provision and data management that are aligned with the needs of the organization. The DSS domain focuses on the process of providing IT services and technical support, which includes aspects of system security, service continuity, training, and optimal data management [13]. The DSS domain consists of 6 Control objectives, which

are as follows: (1) DSS01 - Managing operations; (2) DSS02 - Managing service requests and incidents; (3) DSS03 Managing problems; (4) DSS04 - Managing sustainability; (5) DSS05 - Managing security services, (6) DSS06 - Managing business process control.

E. *Process Assessment Model (PAM)*

The process assessment model (PAM) is a source framework used to assess the level of IT process capability in an organization [14]. PAM is the basis for conducting a thorough and reliable capability level assessment, because it systematically combines various detailed procedures contained in the COBIT 5 framework. Capability Level is used to assess the level of IT maturity in an enterprise, which is adapted from the ISO / IEC 15504 process assessment standard. Capability level has several process levels that can be used to conduct assessments. The following are the levels in the capability level process: (1) Level 0, Incomplete Process: The IT process has not been implemented even though it should have been. (2) Level 1, Performed Process: The IT process is starting to run and is successfully implemented, but not yet fully managed. (3) Level 2, Managed Process: The process has been implemented and managed in a structured manner and can be evaluated. (4) Level 3, Established Process: Processes are implemented based on standards that meet the needs of the organization. (5) Level 4, Predictable Process: Processes are consistent, controlled, and supported by clear measurements. (6) Level 5, Optimizing Process: Processes are continuously improved to support the achievement of organizational goals.

F. *RACI Model*

Responsible, Accountable, Consulted, Informed (RACI), COBIT 5 explains that the RACI chart is a recommendation for assigning process practices to various roles and structures [15]. The purpose of assigning roles and responsibilities is to make the activities and roles of each stakeholder:

(1) R (Responsible), the party directly involved in completing the work and ensuring the activity goes well; (2) A (Accountable), the party authorized to make decisions and give approval for the implementation of an activity; (3) C (Consulted), the party that provides important input and is involved through two-way communication before an action is taken; (4) I (Informed), this party is not directly involved in the implementation, but must know the progress and results.

III. METHODOLOGY

A. *Research Design*

The research design is a mixed methods approach. The qualitative approach is used to obtain in-depth data on the management of information systems through interviews and observations. Meanwhile, the quantitative approach is to understand the extent of the capability level measured through questionnaires. The entire research process refers to the COBIT 5 framework, starting from formulating objectives, collecting and processing data, to analysing the results and preparing recommendations and final conclusions.

B. *Data Collection Stage*

The research instrument is a structured questionnaire prepared based on the COBIT 5 Process Assessment Model (PAM) for the six subdomains DSS01- DSS06 with a total of 38 statement items. The assessment follows the capability level indicators as guided by PAM. The number of respondents in this study were 15 respondents selected based on the RACI chart mapping, namely those who have direct duties and responsibilities for the management and operation of SIAKAD.

TABLE I. RESPONDENT

RACI Roles	**Organizational Structure**	**Number**
Board	Director of learning	1
Bussiness Process Owner	Head of Academic	1
Chief Information Officer	CISDT Director	1
Service Manager	IT Staff	4
Privacy Officer	Academic Staff	8

In addition, in-depth interviews and observations were conducted with two key informants, the Director of Learning and the Director of CISDT. Both were chosen because they have a strategic role in planning, developing and evaluating academic information systems at Alma Ata University

C. *Identification of Organizational Objectives*

Determination of organizational goals can be done through the process of mapping organizational goals, IT-Related Goals, process control, and RACI charts. Mapping SIAKAD strategic goals and objectives aims to identify relevant objectives in the context of evaluating IT governance. IT-Related Goals mapping is used to describe how information technology goals support the achievement of organizational goals. Meanwhile, process control mapping is done to determine the scope of the DSS domain to be analysed in the evaluation process. The RACI chart mapping is used to identify the parties involved as respondents in audit activities with the DSS domain.

D. *Evidence Collection*

This stage is carried out to collect evidence as a basis for the assessment and audit process. After the process that is the focus of the evaluation is determined through the previous mapping, the researcher starts filling out the audit worksheet based on the data or information that has been obtained. Data was generated using interviews and observations of relevant sources.

E. *Data Processing*

At this stage, after the data from the questionnaire results are collected, the next stage is to test the validity and reliability. The validity test of the instrument can be assessed by comparing the value of r count (pearson correlation) with r table, the instrument is considered valid if r count exceeds r

table [16]. The reliability test is carried out with the Cronbach alpha coefficient where the Cronbach alpha value> 0.60 indicates good reliability [17]. After the questionnaire statement items are declared valid and reliable, the data can be processed capabality level. The following are the stages of processing questionnaire data to calculate the capability level : [18]

1. Calculating the recapitulation of respondent answers

$$\mathbf{RK}=\frac{C}{\sum R}\times\mathbf{100} \quad (1)$$

Description:
RK: Recap data of questionnaire answers from respondents.
C : Number of responses at each level (0-5) in each activity
$\sum\mathbf{R}$: Total Respondent

2. Calculating the capability value

$$\frac{(RK\ X\ L0)+(RK\ X\ L1)+(RK\ X\ L2)+(RK\ X\ L3)+(RK\ X\ L4)+(RK\ X\ L5)}{100} \quad (2)$$

Description:
AK: The level of capability obtained
RK: Questinnaire answer from respondents
L : Level scale (0-5)

3. Calculating the gap
GAP = Expected level capability – Level capability (3)

F. *Final Stage*

Capability Level Analysis
This stage measures the level of capability for each DSS domain which is the object of research. The assessment is based on questionnaire data that has been processed, as filled in by stakeholders, so that an overview of current capabilities can be obtained.

Gap Analysis
This stage is carried out to determine the value of the gap between the level of capacity for the current condition and the level of capacity expected by the organisation for the future. The result of gap analysis is the difference between the expected capacity level and the current condition.

G. *Analysis of Recommendations*

After the capability level analysis is carried out, the next stage is to formulate recommendations based on the gap between the existing conditions and the targeted capability level. The target is obtained from interviews with the Directore of Learning and is expected to help the organisation achieve its goals.

IV. Result And Discussion

A. *Mapping Enterprise Goals with IT-Related Goals*

Based on the results of the interview, it is known that the enterprise goals that have been set, the next step is to map their relationship with relevant IT-Related Goals to support the achievement of strategic goals. In this research, the mapping refers to the COBIT 5 Goals Cascade relationship matrix, where each enterprise goal is linked to IT-Related Goals that have a direct contribution to the achievement of IT performance in the Deliver, Service, and Support (DSS) domain.

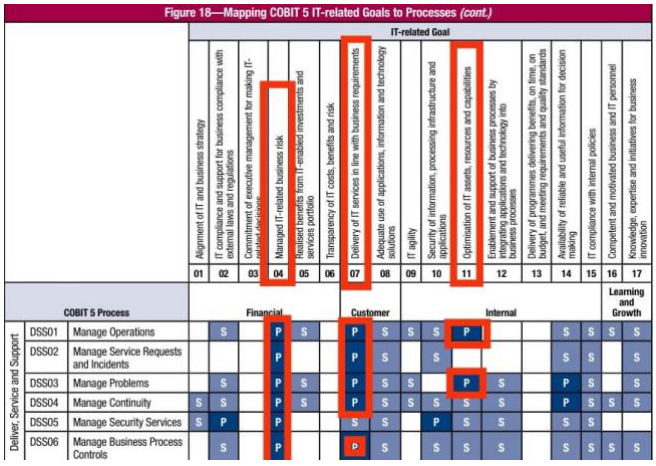

Fig. 1. Mapping IT-Related Goals

This linkage is the basis for determining the DSS domain more focused on strengthening academic services, managing incidents, optimizing SIAKAD performance and making it easier for the academic community, especially students, to access information and SIAKAD services at Alma Ata University anytime and anywhere.

B. *Capability Level Analysis*

Based on the results of the calculation of the capability level value analysis of the 6 domain processes, the level of capability that has been achieved in the management of SIAKAD at Alma Ata University is obtained. The following is a table recapitulating the capability level of each DSS domain process.

TABLE II. CAPABILITY LEVEL

Domain	Current Level	Capability Level
DSS01	4,26	4
DSS02	4,17	4
DSS03	4,16	4
DSS04	4,17	4
DSS05	4,41	4
DSS06	4,26	4

Based on Table II capability level, it is known that the results of questionnaire calculations that have been carried out on the six DSS (Deliver, Service, and Support) process domains have a capability level of 4 for each process domain. The calculation of the capability level value uses the predetermined assessment formula, thus obtaining the capability level results from the questionnaire calculation.

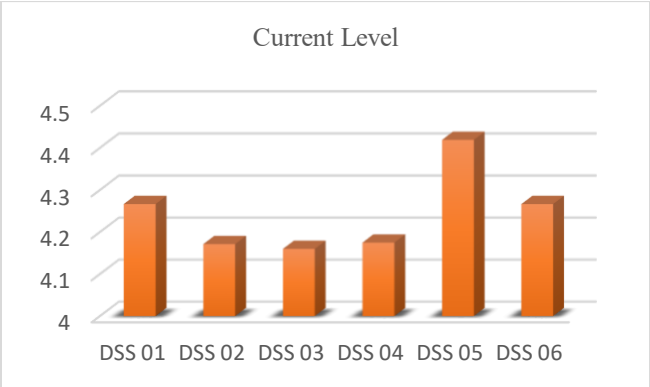

Fig 2. Current Level

C. *Gap Analysis*

The determination of this target level is set at level 5 for each process in the DSS domain, based on interviews conducted with the Directorate of Learning.

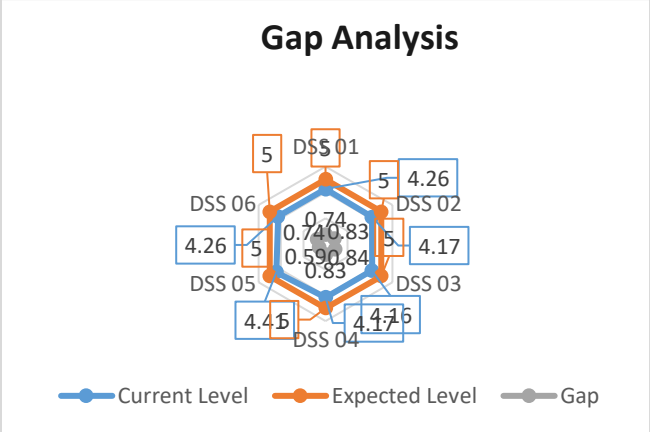

Fig 3. Diagram of Gap Analysis

Based on Figure 4.1, it can be seen that the expected target level for all DSS processes is set at level 5, namely Optimizing Process, which means that the IT process in SIAKAD is continuously improved which is useful for meeting current and future organizational goals. The current condition that occurs is that each DSS domain is at level 4, which has a gap of 1 with the target set. DSS Domain 01 has a capability level value of 4.26 so that the gap is 0.74 to reach the level 5 target. Domain DSS 02 has a capability level value of 4.17 so that the gap is 0.83 to reach the level 5 target. Domain DSS 03 has a capability level value of 4.16 so that the gap is 0.84 to be able to reach target level 5. Domain DSS 04 has a capability level value of 4.17 so that the gap is 0.83 to be able to reach target level 5. Domain DSS 05 has a capability level value of 4.41 so that the gap is 0.59 to be able to reach target level 5. Domain DSS 06 has a capability level value of 4.26 so that the gap is 0.74 to be able to achieve target level 5. The un-achievement of level 5 is due to the lack of optimal procedure documentation, continuous evaluation, and implementation of security and service continuity tests as found in the results of the analysis of each subprocess.

D. *Recommendation*

In achieving the expected targets for each domain that has been determined, there are recommendations made so that SIAKAD management reaches the expected target of level 5. The following are recommendations given based on each process in order to achieve the expected target. (1) DSS 01 Manage Operation is recommended for making reports related to incident tickets so that they are neatly documented and make it easier to find incident data if needed even though problem solving problems are based on established priorities; (2) DSS 02 Manage Service Request and Incidents it is recommended for SIAKAD managers to create incident and service request classification documentation so that every service request received is stored and then entered into the classification model or incident that occurs; (3) DSS 03 Manage Problems it is recommended that SIAKAD managers create documentation of solutions that have been worked on or that have been approved based on priorities to deal with problems received; (4) DSS 04 Manage Continuity is recommended to maintain business continuity so as to ensure that business processes in SIAKAD can run well and according to plan until they are ready to deal with incidents or disruptions; (5) DSS 05 Manage Security Service is recommended that SIAKAD managers conduct penetration testing on SIAKAD and carry out regular maintenance and checks so that the system can run safely; (6) DSS 6 Manage Business Process Controls is recommended that SIAKAD managers maintain existing business control processes and internal audits of business controls also need to be carried out so that the system can adjust to academic needs in real time.

V. Conclusion

The audit conducted on SIAKAD at Alma Ata University, using the COBIT 5 framework with the Deliver, Service, and Support (DSS) domain. Shows the measurement of the level of capability in each sub-process is at level 4, which means that the IT process is operating consistently and is under control, with the application of clear boundaries and measurements based on practices that have been done before. However, all domain processes still have room for improvement towards target level 5, at which level IT processes are incrementally updated to improve performance and achieve organizational goals. This audit shows that the management of academic services through SIAKAD at Alma Ata University has been running well, but still requires continuous improvement and improvement to achieve the desired level of capability.

References

[1] D. H. Gutama, A. A. Harahap, and D. P. Wijaya, "Analisis Pemanfaatan Teknologi Penghubung Lembaga Keuangan Syariah Dengan Usaha Mikro Kecil Menengah Untuk Meningkatkan Pangsa Pasar Syariah Di Yogyakarta," *Jurnal Ilmiah SINUS*, vol. 20, no. 2, p. 13, Jul. 2022, doi: 10.30646/sinus.v20i2.602.

[2] F. R. Kumara and M. T. S. Dewangga, "Peranan penggunaan model pembelajaran e-learning dalam meningkatkan kualitas pembelajaran," *Academy of Education Journal*, vol. 15, no. 1, pp. 288–292, Jan. 2024, doi: 10.47200/aoej.v15i1.2164.

[3] J. Junisnaini, B. Sulfiani, and N. Dewi, "Pengaruh Kualitas Sistem Informasi Akademik (SIAKAD) terhadap Kepuasan Mahasiswa," *Journal of Social and Scientific Education*, vol. 1, no. 3, pp. 119–128, Oct. 2024, doi: 10.58230/josse.v1i3.321.

[4] F. Aldiyanti, S. Auliana, and G. Dwiki Putra Aryono, "Audit of the Tejamari Village Service Website Information System Using the COBIT 5 Framework," *INOVTEK Polbeng - Seri Informatika*, vol. 10, no. 2, pp. 1249–1259, Jul. 2025, doi: 10.35314/9ynwyb87.

[5] J. R. Andika and A. Pakarbudi, "Evaluasi Manajemen Layanan TI pada PT. Mukti Adhi Sejahtera melalui Pengukuran Maturity Level ITIL V3," 2025, pp. 403–412. doi: 10.31284/p.snestik.2025.7132.

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

[7] D. Iqbal Agselmora, A. Prasetyo Utomo, U. Stikubank Semarang, and J. Tri Lomba Juang Mugassari, "Audit Teknologi Informasi Menggunakan COBIT 5 Domain DSS Pada Universitas Stikubank Semarang," *Jurnal Teknik Informatika dan Sistem Informasi*, vol. 9, no. 4, 2022, doi: https://doi.org/https://doi.org/10.35957/jatisi.v9i4.2612.

[8] T. Rahayu, N. Matondang, and B. Hananto, "AUDIT SISTEM INFORMASI AKADEMIK MENGGUNAKAN METODE COBIT 5," *Jurnal Teknologi Informasi dan Pendidikan*, vol. 13, no. 1, pp. 117–123, May 2020, doi: 10.24036/tip.v13i1.305.

[9] Agung Surya Putra, Elmo Raditya Sambhodo, Fariz Mahardhika Aisfa, Muhammad Salfian Nur, and Mochammad Aldi Priyanta, "Audit Menggunakan COBIT 5 Domain DSS pada SIAKAD Universitas Merdeka Malang," *SATESI: Jurnal Sains Teknologi dan Sistem Informasi*, vol. 5, no. 1, pp. 31–37, Apr. 2025, doi: 10.54259/satesi.v5i1.4044.

[10] A. Rahmadiah and E. Zuraidah, "KLIK: Kajian Ilmiah Informatika dan Komputer Audit Sistem Informasi Aplikasi Payroll Management System Menggunakan Framework COBIT 5," *Media Online)*, vol. 4, no. 2, pp. 890–902, 2023, doi: 10.30865/klik.v4i2.1064.

[11] G. Morris William Tangka, A. Tanny Liem, and J. Yuan Mambu, "Information Technology Governance Audit Using the COBIT 5 Framework at XYZ University," in *2020 2nd International Conference on Cybernetics and Intelligent System (ICORIS)*, IEEE, Oct. 2020, pp. 1–5. doi: 10.1109/ICORIS50180.2020.9320803.

[12] W. W. A. Winarto, *Audit Sistem Informasi*. Pekalongan, Central Java: NEM Publisher, 2022. [Online]. Available: https://books.google.com/books/about/Audit_Sistem_Informasi.html?id=1UVkEAAAQBAJ

[13] R. Widayanti and G. N. V. Lestari, "TINGKAT CAPABILITY TATA KELOLA TI PADA SIAKAD MENGGUNAKAN FRAMEWORK COBIT 2019," *Sebatik*, vol. 26, no. 1, pp. 377–386, Jun. 2022, doi: 10.46984/sebatik.v26i1.1854.

[14] ISACA, *Process Assessment Model (PAM): Using COBIT 5*. Rolling Meadows, Illinois, USA: ISACA, 2013. [Online]. Available: https://www.isaca.org/bookstore/bookstore-cobit-digital/wcbpam

[15] ISACA, *COBIT 5: Enabling Processes*. Rolling Meadows, Illinois, USA: ISACA, 2012. [Online]. Available: https://www.isaca.org/resources/cobit

[16] F. Rohmah and S. K. M. K. A. Ratnasari, "Analisis Niat menggunakan Aplikasi Clubhouse dengan Model Theory of Planned Behavior," *Informatik : Jurnal Ilmu Komputer*, vol. 19, no. 2, pp. 115–121, Sep. 2023, doi: 10.52958/iftk.v19i2.6229.

[17] F. D. P. Anggraini, A. Aprianti, V. A. V. Setyawati, and A. A. Hartanto, "Pembelajaran Statistika Menggunakan Software SPSS untuk Uji Validitas dan Reliabilitas," *Jurnal Basicedu*, vol. 6, no. 4, pp. 6491–6504, May 2022, doi: 10.31004/basicedu.v6i4.3206.

[18] F. Febriani and A. D. Manuputty, "Evaluasi Tata Kelola Guna Meningkatkan Kinerja Manajemen Teknologi Informasi Menggunakan Framework COBIT 5," *Jurnal Teknik Informatika dan Sistem Informasi*, vol. 7, no. 1, Apr. 2021, doi: 10.28932/jutisi.v7i1.3260.