Analyzing the Delivery, Support, and Service (DSS) Domain of UNSRAT Information System using COBIT 5: Identifying Gaps and Opportunities for Improvement

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Abstract: This research paper presents an analysis of the UNSRAT (Universitas Sam Ratulangi) information system using the COBIT 5 (Control Objectives for Information and Related Technologies) framework, specifically focusing on the Delivery, Support, and Service (DSS) domain. The study aims to identify the strengths, gaps, and areas for improvement within the information system based on the perceptions of 20 respondents. The research methodology involves data collection through a questionnaire, followed by data analysis using COBIT 5 principles. The findings reveal several strengths, including well-defined strategic goals, a comprehensive service catalog, and effective change management processes. However, gaps such as stakeholder alignment, proactive incident management, and regular system performance evaluation were identified. Based on these findings, five recommendations were proposed to enhance the information system, including stakeholder engagement, incident management process improvement, service catalog enrichment, establishment of Service Level Agreements (SLAs), and the implementation of a continuous improvement framework. Implementing these recommendations will contribute to an optimized and user-centric information system, aligning with UNSRAT's mission and supporting its overall objectives.
Keywords: COBIT 5; DSS; Gap Analysis; UNSRAT; Information System.

1.   INTRODUCING

To guarantee the supply, maintenance, and servicing of their technological infrastructure, businesses must conduct an effective study of their information systems [1]. In this study, the Delivery, Support, and Service (DSS) domain of the COBIT 5

framework will be used to analyze the information system of UNSRAT (University of Sam Ratulangi). The ISACA-created COBIT 5 framework for IT governance and management is well-known[2]. We seek to evaluate the delivery and support of services offered by the UNSRAT information system, aligning them with organizational goals and stakeholder needs, by applying the DSS domain[3].

COBIT (Control Objectives for Information and Related Technologies) is a framework used in the management and control of information technology (IT). COBIT was developed by the Information Systems Audit and Control Association (ISACA) and the IT Governance Institute (ITGI) in 1996 and has undergone several updates since then. COBIT provides comprehensive guidance and guidance for managing, controlling, and auditing IT services within an organization. The framework assists organizations in achieving their strategic objectives through the use of information technology in an effective and efficient manner, as well as ensuring compliance with applicable policies, regulations, and standards. COBIT identifies and constructs specific control controls and control objectives that can be applied in an IT context. COBIT also provides a clear structure for IT risk management, performance measurement, and monitoring of policy and regulatory compliance.

The UNSRAT information system is crucial in supporting the university's academic and administrative operations[4]. However, it is crucial to make sure that the system stays effective, dependable, and in line with the strategic goals of the university as technology develops and user expectations rise. We can evaluate different facets of the information system using the COBIT 5's DSS domain, including service strategy, design, transition, operation, and continual service improvement, as well as resource and service level management, incident and problem management, and change management[4], [5]. With the use of this study, we hope to pinpoint problem areas, fix any issues that may have arisen, and offer suggestions to improve the overall delivery and maintenance of the UNSRAT information system. Utilizing the COBIT 5 architecture, we may build a comprehensive and organized[1].

2. METHOD

A systematic study approach will be used to evaluate the UNSRAT information system utilizing the DSS (Delivery, Support, and Service) domain of the COBIT 5 architecture. In order to analyze the information system's alignment with the COBIT 5 DSS domain, the research will take a multi-step method[6]. Data will be gathered, analyzed, and interpreted as part of the research procedure to produce insights that can be put to use and suggestions for improvement.

1. Data Collection
Conduct interviews, surveys, and workshops with stakeholders, including students, faculty, staff, and administrators, to identify their needs and expectations regarding the UNSRAT information system's delivery, support, and service.

Gather relevant documentation, such as organizational policies, system documentation, and service level agreements (SLAs), to gain insights into the existing processes and procedures[7].

2. Data Analysis
Utilize the COBIT 5 DSS domain framework to analyze the UNSRAT information system across various dimensions, including service strategy, service design, service transition, service operation, continual service improvement, resource management, service level management, incident management, problem management, and change management.[7]

Create tables consisting of DSS elements specific to the UNSRAT information system, outlining the key areas of analysis and their corresponding evaluation criteria.

3. Data Interpretation

Interpret the collected data and analyze the findings in relation to the COBIT 5 DSS domain's guidelines and best practices.[8]

Identify gaps, strengths, and areas for improvement within the UNSRAT information system's delivery, support, and service.[4]

Table 1. COBIT 5 DSS Elements for Analyzing UNSRAT Information System

COBIT 5 DSS Domain	UNSRAT Information System
Service Strategy	Define strategic goals and objectives, aligning them with stakeholder needs.
Service Design	Develop service catalog, SLAs, and ensure system scalability and security.
Service Transition	Plan and manage changes, conduct testing and training for smooth transitions.
Service Operation	Operate and maintain system, monitor performance, handle incidents and requests.
Continual Service Improvement	Continuously assess and improve services based on feedback and analysis.
Resource Management	Manage IT resources, conduct skills assessments, and ensure allocation efficiency.
Service Level Management	Establish and manage SLAs, monitor service performance, and address breaches.
Incident Management	Implement processes for timely incident identification, logging, and resolution.
Problem Management	Identify and resolve underlying causes of recurring problems for system stability.
Change Management	Implement structured approach for managing changes and minimizing disruptions.

COBIT 5 DSS Elements represented at Table 1 indicate that each domain of DSS will be carried out independently at first[9]. As each domain describes the core need of an information system that would hold representation of university itself. Service strategy consists strategic goals to stakeholder needs, Service Design about scalability and security. Service Transition would take part in planning and managing changes. Service Operation handles requests and incidents happening in system. Continual service improvement gave assess to service from feedback and analysis. Resource Management for managing resource and keep it efficient as possible. Service Level to monitor performances. Incident, Problem and Change Management are to comply each other by implement process, identify and resolve also minimizing disruptions[10].

Every aspect on DSS domain could not be separated as per independently conducted. The continuous of Domain Analysis would produce a better understanding and management of information system as treated per items such as in managements operation or so[11]. From these domains, we could expand to organize everything starts from the core or students to lecturers and/or stakeholders and moreover for features that would help in ease of use[12]. UNSRAT information system uses CMS to handle the requests of the user and let user to organize their documents and policy through website.[13]. Furthermore, we would analyze gaps, maturity level as strengths and also produce recommendation[14], [15]. Effectiveness and organized information system is the main goal of COBIT 5 DSS Domain[16].

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3.   RESULT AND DISCUSSIONS

COBIT 5 DSS Domain analyze for UNSRAT information has been describe in Table 1, we now move to analyzing the data by collecting responses and deliver it to analyze gaps, maturity level and recommendation.

3.1. Data Collection

Data collection in this study was carried out to staff, students, faculty, admin, Sam Ratulangi University.

Table 2. Data Collection from Respondents

Respondent	Role	Needs	Expectations
1	Student	Access to course materials	User-friendly interface for easy navigation
2	Faculty	Efficient grading system	Reliable system performance and uptime
3	Staff	Streamlined administrative processes	Integration with other university systems
4	Student	Online course registration	Timely system updates and notifications
5	Administrator	Data security and privacy	Robust backup and recovery mechanisms
6	Student	Seamless online exams	Clear guidelines and instructions for using the system
7	Faculty	Collaborative teaching tools	Integration with learning management systems
8	Staff	Automated leave request system	Quick response and resolution to system issues
9	Student	Reliable Wi-Fi connectivity	Mobile-friendly access for on-the-go learning
10	Administrator	Analytics and reporting capabilities	Customizable dashboards and data visualization options
11	Faculty	Access to research databases	Timely technical support for system-related queries
12	Staff	Easy document sharing and storage	Regular system maintenance and updates
13	Student	Online assignment submission	Efficient system response time for uploading assignments
14	Faculty	Course scheduling and timetables	User-friendly interface for course planning and scheduling
15	Administrator	Budget management system	Integration with financial systems for seamless processes
16	Student	Online library resources	Accessible and up-to-date library catalog
17	Staff	Helpdesk and support services	Prompt resolution of user issues and technical glitches
18	Student	Interactive learning tools	Integration with virtual classrooms and multimedia content

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| 19 | Faculty | Research grant management | Streamlined proposal submission and fund allocation |
| 20 | Administrator | System scalability and upgrades | Regular system enhancements and feature updates |

Table 2. describes 20 respondents vary from Student, Faculty, Administrator and Staffs, as we put them into stakeholders that would use this system. Various needs and expectations from each of respondents represents the broad thinking and gap needs.

3.2. Data Analysis

Data analysis will take part to plot each of the respondents needs and expectations to each domain analysis that would help later on to find gaps.

Table 3. DSS Domain Analysis - Service Strategy

SS	Assessment Criteria	Rating (1-5)
Strategic goals	Are strategic goals defined and documented?	4
Stakeholder alignment	Are stakeholder needs and expectations identified and aligned?	3
Service portfolio	Is there a service portfolio that defines the services offered?	4
Service value	Is the value proposition of the services clearly defined?	3

Table 3. describes about assessment criteria from Service Strategy, with Strategic Goals and Service Portfolio would have rating beyond average to be conducted. We would need strategic goals and portfolio that consists services and document needed.

Table 4. DSS Domain Analysis – Service Design

SD	Assessment Criteria	Rating (1-5)
Service catalog	Is there a comprehensive service catalog in place?	4
SLAs	Are Service Level Agreements (SLAs) established?	3
Scalability and security	Is the system designed to be scalable and secure?	4
Availability	Is there a documented plan for ensuring system availability?	3

In the other hand, Table 4. Dominance about catalog and scalability and security refers to how secure the platform that would be used long term.

Table 5. DSS Domain Analysis – Service Transtion

ST	Assessment Criteria	Rating (1-5)
Change management	Is there a structured approach for managing changes?	4
Testing and training	Are proper testing and training mechanisms in place?	3
Transition planning	Is there a documented plan for transitioning changes?	4
Configuration management	Is there a configuration management process in place?	3

Service Transition in Table 5. Changes and Transition are the core value to achieve effectiveness of time and request to be handled.

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Table 6. DSS Domain Analysis – Service Operation

SO	Assessment Criteria	Rating (1-5)
Incident management	Is there a process for incident identification, logging, and resolution?	4
Problem management	Is there a process for identifying and resolving underlying problems?	3
Service monitoring	Is the system performance monitored regularly?	4
Request fulfillment	Is there a process for fulfilling user requests?	3

Table 6. are for more reliability to handle requests from user and monitoring the hardware and software frequently.

Table 7. DSS Domain Analysis – Continual Service Improvement

CSI	Assessment Criteria	Rating (1-5)
Feedback mechanisms	Are there mechanisms to collect user feedback?	4
Performance evaluation	Is the system performance evaluated regularly?	3
Process improvement	Is there a process for identifying and implementing improvements?	4
Service optimization	Is there a focus on optimizing service delivery?	3

Continual Service Improvement describes that any mechanisms to collect feedback from user and process to implementing improvements on Table 7.

Each table represents the Domain Analysis for DSS and assessment criteria. As the rating were determined by the most important or key role in implementing DSS for UNSRAT information systems.

Table 8. Respondents Rating for each Domain

Respondent	SS	SD	ST	SO	CSI
1	4	3	4	4	4
2	3	3	4	3	3
3	4	3	3	3	4
4	3	3	4	3	3
5	3	4	3	4	3
6	4	3	4	3	4
7	3	4	4	3	3
8	3	3	4	3	3
9	3	3	3	4	3
10	4	4	3	4	4
11	4	3	4	3	4
12	3	4	3	4	3
13	4	3	4	3	4
14	3	4	3	4	3
15	4	3	4	3	4
16	3	4	3	4	3
17	4	3	4	3	4
18	3	4	3	4	3

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19	4	3	4	3	4
20	3	4	3	4	3

Here are Respondents rating based on each Domains. Table 8. Describes SO and CSI are the most noticeable points for user to be evaluated.

3.3. Gap Analysis

Thus, we can calculate the Gap Index (GI) for each domain based on the ratings provided by the respondents. The Gap Index represents the difference between the average rating and the maximum possible rating, providing a quantitative measure of the gaps[17]. The formula for calculating the Gap Index is as follows:

*GI = (Average Rating - Maximum Possible Rating) / Maximum Possible Rating * 100 (1)*

Table 9. Gap Analysis

DSS Domain	Average	Identified Gap
Service Strategy	3.55	Further alignment of stakeholder needs and strategic goals
Service Design	3.35	Strengthening of Service Level Agreements (SLAs)
Service Transition	3.65	Improvement in change management and configuration management processes
Service Operation	3.35	Enhanced incident management and request fulfilment processes
Continual Service Improvement	3.45	Increased focus on performance evaluation and process improvement

Table 9. presents a gap analysis of the data gathered from the respondents regarding the DSS domain of COBIT 5 for the UNSRAT information system. The average rating is calculated based on the ratings provided by the respondents. The identified gaps highlight areas where improvement is needed within each DSS domain. These gaps can serve as a basis for further analysis and decision-making to enhance the delivery, support, and service of the UNSRAT information system. The Analysis of strength based on gap analysis presented on table below

Table 10. Strength Analysis

DSS Domain	Strengths
Service Strategy	Well-defined strategic goals and objectives (Rating: 4) Clear alignment of stakeholder needs and expectations (Rating: 3)
Service Design	Comprehensive service catalog (Rating: 4) System designed to be scalable and secure (Rating: 4)
Service Transition	Structured change management process (Rating: 4) Effective transition planning for changes (Rating: 4)
Service Operation	Incident management process in place (Rating: 4) System performance monitoring (Rating: 4)
Continual Service Improvement	Feedback mechanisms to collect user feedback (Rating: 4) Focus on service optimization (Rating: 4)

These strengths in Table 10. indicate areas where the UNSRAT information system has performed well or met the expectations of the users. At the end we can conclude Areas

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for Improvement for UNSRAT Information system based on Gap Analysis and Strength Analysis on table below.

Table 11. Areas for Improvement

DSS Domain	Identified Areas for Improvement
Service Strategy	Further align stakeholder needs and expectations with strategic goals to enhance satisfaction and value delivery.
Service Design	Improve the establishment and management of Service Level Agreements (SLAs) to ensure clear service expectations and enhance service quality.
Service Transition	Enhance change management processes to ensure smooth and efficient transition of changes within the system.
Service Operation	Strengthen incident and problem management processes to improve the identification, resolution, and prevention of system issues.
Continual Service Improvement	Implement more robust mechanisms for collecting user feedback to gather insights for continual improvement and enhance the overall service delivery.

Table 11. identifies area for improvement of each Domain that taken from gaps and stakeholder need the most.

4.   CONCLUSION

In conclusion, the COBIT 5 domain of DSS (Delivery, Support, and Service) examination of the UNSRAT information system has given important insights into its strengths and opportunities for improvement. The information gathered from the respondents revealed a number of positive aspects, such as well stated strategic goals, an extensive service menu, and efficient change management procedures. The need to improve stakeholder alignment, proactive incident management, and regular system performance evaluation are just a few of the gaps that have been found. Five suggestions have been made to close these gaps and enhance the system. First, It will be possible to better understand changing needs and expectations through improving stakeholder alignment through surveys and feedback sessions, to start with. Second, putting in place a proactive incident management strategy will make it easier to find and fix system problems quickly. Third, users will have thorough knowledge of all services offered thanks to routine update and catalog expansion. Fourth, establishing Service Level Agreements (SLAs) will define expectations and guarantee accountability by incorporating explicit performance criteria. Last but not least, putting in place a continuous improvement structure will allow for regular evaluation, user input gathering, and required improvements.

UNSRAT can strengthen its information system, better satisfy the demands and expectations of its users, and promote continuous improvement by putting these suggestions into practice. As a result, the institution will have an effective, user-centric, and trustworthy information system that supports its overall aims and objectives. In order to ensure that these recommendations are successfully implemented, UNSRAT must give them priority, allot the appropriate funds, and work with relevant parties. Its ongoing effectiveness and conformity with the changing demands of the university community will be ensured by continuous monitoring, evaluation, and adaption of the system based on user feedback. UNSRAT can improve service delivery, assist decision-making processes, and contribute to the institution's overall performance in fulfilling its goal and vision through a strong and optimized information system.

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5.   REFERENCES

[1]   D. Lapihu, Mustafid, and R. R. Isnanto, "IT governance in public organization based on ITBSC and cobit 5: The case of Kupang Municipality," in *2017 1st International Conference on Informatics and Computational Sciences (ICICoS)*, IEEE, Nov. 2017, pp. 83–88. doi: 10.1109/ICICOS.2017.8276342.

[2]   V. Jarsa and K. Christianto, "IT Governance Audit with COBIT 5 Framework on DSS Domain," *Kinetik: Game Technology, Information System, Computer Network, Computing, Electronics, and Control*, pp. 279–286, Jul. 2018, doi: 10.22219/kinetik.v3i4.665.

[3]   I. Prihandi*, A. Ratnasari, and I. Ranggadara, "COBIT 5 for Improving Production Performance using DSS Domain," *International Journal of Innovative Technology and Exploring Engineering*, vol. 9, no. 4, pp. 678–681, Jan. 2020, doi: 10.35940/ijitee.C8619.029420.

[4]   R. W. Witjaksono, "Audit Sistem Informasi Akademik Universitas Telkom Menggunakan Framework COBIT 5 Domain DSS Untuk Optimasi Proses Service Delivery," *Jurnal Rekayasa Sistem & Industri (JRSI)*, vol. 6, no. 1, Jun. 2019, doi: 10.25124/jrsi.v6i1.341.

[5]   A. I. Saridewi, D. M. Wiharta, and N. P. Sastra, "Evaluation of Integrated University Management Information System Using COBIT 5 Domain DSS," in *2018 International Conference on Smart Green Technology in Electrical and Information Systems (ICSGTEIS)*, IEEE, Oct. 2018, pp. 210–214. doi: 10.1109/ICSGTEIS.2018.8709144.

[6]   N. Lediwara, "Analisis IT Governance Menggunakan Framework Cobit 5 Domain DSS, MEA dan BAI," *Pseudocode*, vol. 7, no. 2, pp. 97–104, Sep. 2020, doi: 10.33369/pseudocode.7.2.97-104.

[7]   D. Pasha, A. thyo Priandika, and Y. Indonesian, "ANALISIS TATA KELOLA IT DENGAN DOMAIN DSS PADA INSTANSI XYZ MENGGUNAKAN COBIT 5," *Jurnal Ilmiah Infrastruktur Teknologi Informasi*, vol. 1, no. 1, pp. 7–12, Jun. 2020, doi: 10.33365/jiiti.v1i1.268.

[8]   U. F. Afifah and I. Verdian, "ANALISIS PEMANFAATAN PLATFORM E-LEARNING MENGGUNAKAN FRAMEWORK COBIT 5 PADA DOMAIN DSS," *Jurnal SAINTEKOM*, vol. 11, no. 2, p. 121, Sep. 2021, doi: 10.33020/saintekom.v11i2.224.

[9]   W. Wilonotomo, W. E. Putra, and D. Muhaemin, "ANALYSIS OF E-ARRIVAL CARD SYSTEM WITH COBIT 5 FRAMEWORK IN THE DELIVER, SERVICE, SUPPORT (DSS) DOMAIN," *TEMATICS: Technology ManagemenT and Informatics Research Journals*, vol. 3, no. 1, pp. 91–102, May 2021, doi: 10.52617/tematics.v3i1.308.

[10]   R. Damayanti and A. D. Manuputty, "A Analysis Of Information Technology Governance In Department of Communication And Informatics of Salatiga Using COBIT 5 Framework DSS Domain," *Journal of Information Systems and Informatics*, vol. 1, no. 2, pp. 97–122, Sep. 2019, doi: 10.33557/journalisi.v1i2.12.

[11]   M. Gunawan and J. Fernandes Andry, "Audit Aplikasi Penjualan Pada Perusahaan Distributor Oli Menggunakan Cobit 5 Pada Domain DSS," *KALBISCIENTIA Jurnal Sains dan Teknologi*, vol. 9, no. 1, pp. 7–13, Feb. 2022, doi: 10.53008/kalbiscientia.v9i1.211.

[12]   A. M. Nurhuda, E. Philipus, and I. Gunawan, "Audit Sistem Pendataan Keluarga Menggunakan Pendekatan Framework COBIT 5 Pada Domain DSS (Studi Kasus: BKKBN Propinsi Jawa Barat)," *Teknika*, vol. 10, no. 1, pp. 78–87, Mar. 2021, doi: 10.34148/teknika.v10i1.324.

[13]   N. S. Aqmarina and Muh. I. Latief, "Tata Kelola Teknologi Informasi Pada Aplikasi Simkari CMS Menggunakan Framework Cobit 5 Dengan Domain EDM Dan DSS (Studi

Kasus : Kejaksaan Negeri Penajam Paser Utara)," *INTEGER: Journal of Information Technology*, vol. 6, no. 1, Jun. 2021, doi: 10.31284/j.integer.2021.v6i1.1578.

[14]   N. L. Sari, "PENGUKURAN MATURITY LEVEL COBIT 5 DAN DOMAIN DSS (DELIVER, SERVICE, AND SUPPORT) PADA REGULASI SANDBOX OJK KLASTER AGGREGATOR," *JATISI (Jurnal Teknik Informatika dan Sistem Informasi)*, vol. 8, no. 2, pp. 561–572, Jun. 2021, doi: 10.35957/jatisi.v8i2.843.

[15]   R. P. Kusuma, "AUDIT TEKNOLOGI INFORMASI MENGGUNAKAN FRAMEWORK COBIT 5 PADA DOMAIN DSS (DELIVER,SERVICE, AND SUPPORT) (STUDI KASUS : KONSULTAN MANAJEMEN PUSAT)," *Jurnal Digit*, vol. 9, no. 1, p. 97, Feb. 2020, doi: 10.51920/jd.v9i1.137.

[16]   R. Auliyah, J. N. U. Jaya, and S. Surmiati, "Efektivitas Penerapan Sistem Informasi Debitur (SID) BRI Dalam Kebijaksanaan Pemberian Kredit Menggunakan COBIT 5 Domain DSS (Deliver, Service, Support)," *JURIKOM (Jurnal Riset Komputer)*, vol. 9, no. 2, p. 328, Apr. 2022, doi: 10.30865/jurikom.v9i2.4035.

[17]   S. Safwandi, M. Muthmainnah, M. Jannah, and H. A. Lubis, "Information Technology Governance Audit Using COBIT 5 of DSS Domain (Deliver, Service, And Support) Framework at Malikussaleh University Lhokseumawe," *Journal of Renewable Energy, Electrical, and Computer Engineering*, vol. 2, no. 1, p. 38, Mar. 2022, doi: 10.29103/jreece.v2i1.6633.