



STRENGTHENING THE ADMINISTRATION SYSTEM OF SCHOLARSHIP DATA COLLECTION BASED ON DIGITAL SERVICES TO ENCOURAGE GOOD ACCOUNTABILITY AND PROGRAM BENEFITS

Ariyani Widyastuti^{1✉}, Diyamon Prasandha²

DOI: <https://doi.org/10.15294/jeec.v14i2.31989>

^{1,2} Universitas Negeri Semarang

History Article

Received:
August 7, 2025
Accepted:
August 26, 2025
Published:
December 15, 2025

Keywords:

Scholarship System,
PIECES, Digitalization,
Good Accountability,
Importance
Performance Analysis

Abstract

Scholarship programs have a strategic role in expanding access to higher education and improving the quality of human resources. However, at Universitas Negeri Semarang (UNNES), the scholarship administration system still faces a number of obstacles such as lack of data integration, delayed disbursement, and potential double funding. This study aims to analyze the condition of UNNES scholarship system (MyUnnes-Student) management with PIECES (Performance, Information, Economic, Control, Efficiency, and Service) approach and evaluate the design of digital-based system in supporting the principle of good accountability. The method used is quantitative with questionnaire instruments and Importance Performance Analysis (IPA) analysis of 78 respondents from students, education personnel, and external parties. The results showed that all PIECES variables obtained satisfaction scores above 3.5 (category "Satisfied"), with the highest score on the Economic variable (4.06). However, the Performance and Information variables scored the lowest (3.66), and were in the low priority category in IPA, indicating a gap between expectations and actual performance. Integrated digital systems are proven to improve efficiency, control and service, and strengthen accountability through better data transparency and audit trails.

© 2025 Universitas Negeri Semarang

✉ Correspondence address:
Write the full address of corresponding author
E-mail: ariyaniw@mail.unnes.ac.id

INTRODUCTION

Scholarships are a form of strategic support to expand access to higher education and improve the quality of human resources (Abd et al., 2024). In its implementation, the scholarship program is expected to provide optimal benefits to students in need. However, one of the main challenges in scholarship management at Universitas Negeri Semarang (UNNES) is the lack of integration between student data and financial data (Anggun et al., 2023; Basri, 2017). This often leads to various problems, such as delays in disbursement, misallocation, and the potential for *double funding*. This problem not only affects the beneficiaries, but also risks reducing public trust in the scholarship program at UNNES (Irmansyah et al., 2024; Kalua et al., 2024).

Along with technological developments, strengthening the data administration system based on digital services is the right solution to overcome these challenges. Digital systems enable better data integration between students and finance, so that the verification and disbursement process can be carried out more quickly and accurately (Alita et al., 2021). In addition, the system also allows for centralized data management, minimizing the potential for double funding errors and increasing transparency in the management of the scholarship program.

Integration of student and financial data through digital services provides benefits not only in the efficiency of the fund disbursement process, but also in monitoring and reporting (Iqram et al., 2024). With an integrated digital system, scholarship program managers can monitor the status of fund disbursement in real-time and ensure that the allocation of funds goes according to plan (Faiz, 2020; Gunawan et al., 2018). This is in line with the principle of *good accountability*, which prioritizes accountability, transparency, and optimal benefits from the use of public funds.

Given the strategic role of the scholarship program in supporting increased access to education and the development of quality human resources. Amidst the increasing number of student scholarship recipients and the complexity of data management, manual or fragmented administrative systems often become an obstacle in ensuring a smooth fund distribution process. This leads to various problems, such as delays in disbursement, lack of transparency, and potential *double funding*, which can be detrimental to beneficiaries and reduce the credibility of the scholarship program (Kabelen et al., 2024). By integrating student data and financial data through the UNNES digital service-based administration system, the verification and disbursement process can be done more quickly, accurately, and efficiently. The urgency of this research lies in the need to provide technology-based solutions to overcome these challenges. System digitization is not only able to improve operational efficiency, but also support the creation of transparency and accountability which are the basic principles in the management of public funds.

The purpose of this research is to analyze the current condition of the scholarship system management at UNNES using the PIECES approach and evaluate the design of the scholarship system design at UNNESin applying the principles of *good accountability*.

METHODS

This research uses a quantitative approach with primary data. Respondents in this study were UNNES academic community scholarship users totaling 78 people. Data collection was done by questionnaire technique. This questionnaire was made based on 6 variables from the PIECES Framework (Fahmi and Indahyanti, 2024) to answer the first objective in analyzing the current condition of scholarship system management at UNNES. The research method to answer the

second objective used *Importance Performance Analysis* (IPA) method obtained from the questionnaire using Likert scale which aims to evaluate the design of scholarship system design at UNNESin applying the principle of *good accountability*.

Table 1. PIECES Framework

No	Variable	Number of Questionnaire Statements
1	<i>Performance</i>	4
2	<i>Information</i>	4
3	<i>Economic</i>	3
4	<i>Control</i>	4
5	<i>Efficiency</i>	3
6	<i>Service</i>	4

Table 2. PIECES Framework Questionnaire Statement

No	Variable	Statement
1	<i>Performance</i>	The current scholarship administration system has a fast response time. The scholarship submission and verification process run efficiently. The current system is able to handle a high number of applicants without experiencing interruptions.
2	<i>Information</i>	I rarely experience delays in getting scholarship-related information. Information regarding scholarships in the current system is easy to access and understand. The data presented in the scholarship system is always accurate and up to date.
3	<i>Economic</i>	The system provides clear notifications or updates regarding scholarship status. There is transparency in determining scholarship recipients through the system. The scholarship administration system helps reduce operational costs compared to the manual system. Digital-based scholarship management saves time and resources.
4	<i>Control</i>	The implementation of a digital system in scholarship administration helps reduce input errors and data duplication. The system has good security features to protect student data. Only authorized parties can access and manage scholarship data. The system provides activity logs to ensure accountability of data management.
5	<i>Efficiency</i>	I feel safe in using the scholarship administration system regarding personal data protection. The scholarship administration system facilitates the document collection process without the need for many manual procedures. I can easily monitor the status of my scholarship application in real-time.

6	<i>Service</i>	The current system reduces the workload of scholarship administration compared to the previous method.
		The digital-based scholarship administration service is easy to use.
		The system has a user-friendly display and is not confusing.
		In case of any problems, technical support or assistance services are well available.
		I am satisfied with the use of the digital system in scholarship management at UNNES.

Table 3. Satisfaction Likert Scale

Answer Options	Value
Very Satisfied	5
Satisfied	4
Quite Satisfied	3
Unsatisfied	2
Very Dissatisfied	1

The Likert scale is then determined the average level of satisfaction with use using the following formula equation:

$$RK = \frac{JSK}{JK} \dots\dots\dots (1)$$

Where RK = average satisfaction or importance, JSK = Number of questionnaire scores, JK = Number of questionnaires [19].

Table 4. Average Satisfaction

Value Range	Satisfaction Predicate
1,00 - 1,79	Very Dissatisfied
1,80 - 2,59	Unsatisfied
2,60 - 3,39	Quite Satisfied
3,40 - 4,79	Satisfied
4,80 - 5,00	Very Satisfied

RESULT AND DISCUSSION

Based on the distribution of respondents, 65.4% came from students, followed by 28.2% of education staff, and 6.4% from external parties such as partners or auditors. This composition shows that the perception of the UNNES scholarship system is dominated by direct users, namely students, who are the main beneficiaries. The involvement of education staff in the survey reflects the views of administrative managers, thus reflecting the technical and procedural effectiveness of the scholarship system. Meanwhile, although the number of external respondents is relatively small, their presence provides an important perspective on the governance, transparency and accountability aspects of the system from outside the institution. This diverse composition of

respondents provides a fairly comprehensive picture in assessing the extent to which the UNNES scholarship system has reflected the principles of good accountability through the perceptions of both internal and external users.

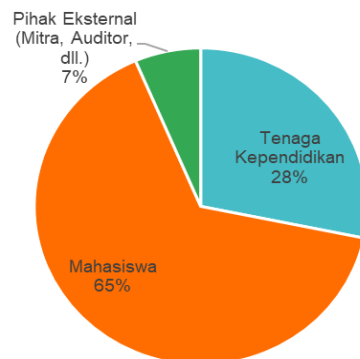


Figure 1. Composition of Respondents
Source: Data Processed, 2025

Based on the respondents' length of involvement with Universitas Negeri Semarang (UNNES), most respondents, 80.8%, have been involved for 1-3 years. Meanwhile, 10.3% have been involved for 4-6 years, and only 9.0% are relatively new with less than 1 year of involvement. This composition shows that the majority of respondents have sufficient experience in interacting with the UNNES administrative system and environment, including the scholarship system. This is important because their assessment of the performance, efficiency and accountability of the system is based on relatively adequate experience and is not momentary. Meanwhile, the presence of new respondents with more than 4 years of experience also complements the perspective on the sustainability and changes in the scholarship system over time. Thus, this data strengthens the validity of respondents' perceptions of the PIECES-based evaluation of the scholarship system and its relation to the principle of *good accountability*.

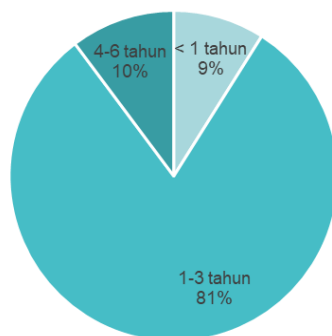


Figure 2. Respondents' length of engagement with UNNES
Source: Data Processed, 2025

Based on Table 5. the results of measuring the level of respondents' satisfaction with the UNNES scholarship system show that all PIECES variables obtained an average value above 3.5

with the category "Satisfied". The economic variable obtained the highest score of 4.06, reflecting that the system is considered capable of providing cost efficiency and ease of access, for example through digitizing the process without having to be present in person. Furthermore, the control (3.99), service (3.89), and efficiency (3.88) variables show that the system has provided adequate services in terms of security, ease of use, and speed of administrative processes. However, the lowest scores were on the performance and information variables, each with a score of 3.66. This indicates that there are still challenges in terms of system stability and the speed of presenting accurate and timely information. Although respondents were generally satisfied, these scores indicate that technical performance and clarity of information need to be prioritized to improve the overall quality of the system and strengthen the principles of *good accountability*, especially in the dimensions of transparency, responsiveness, and reliability of digital services.

Table 5. Respondents' Satisfaction Level of UNNES Scholarship System

Variable	Average	Predicate
Performance	3,66	Satisfied
Information	3,66	Satisfied
Economic	4,06	Satisfied
Control	3,99	Satisfied
Efficiency	3,88	Satisfied
Service	3,89	Satisfied

Source: Data Processed, 2025

The results of the analysis using the Importance Performance Analysis (IPA) method show that only one variable is in the "Keep up the good work" category, namely Economic with a suitability level of 81.28%. This indicates that the UNNES scholarship system is considered to have met user expectations in terms of cost efficiency, ease of access, and resource savings, so it is a strength that needs to be maintained. Meanwhile, the other five variables, namely Performance (73.21%), Information (73.14%), Control (79.74%), Efficiency (77.69%), and Service (77.76%) are all in the "Low Priority" category. Although considered quite adequate in terms of satisfaction, a high level of importance that has not been accompanied by equivalent performance indicates an *expectation gap* that can reduce overall accountability perceptions. Especially in the information and performance aspects, the low scores indicate that users feel the system is not fully responsive and informative, potentially hampering the transparency and speed of scholarship services.

Table 6. Importance Performance Analysis (IPA) Results

Variable	Result Calculation	Description
Performance	73,21%	Low Priority
Information	73,14%	Low Priority
Economic	81,28%	Keep up the good work
Control	79,74%	Low Priority
Efficiency	77,69%	Low Priority
Service	77,76%	Low Priority

Source: Data Processed, 2025

The formulation of PIECES Analysis Results based on answers from respondents is:

Table 7. Formulation of PIECES Analysis Results

Criteria	Old System	New System
Performance	<ol style="list-style-type: none"> 1. The performance of the scholarship administration system in managing student data and disbursing funds is often slow and hampered by manual processes. 2. Data verification is done manually, which is time-consuming and prone to errors. 	<ol style="list-style-type: none"> 1. An integrated digital-based system enables <i>real-time</i> data processing, speeds up the fund disbursement process, and ensures more accurate data. 2. Automation systems improve performance, reduce processing time, and increase data verification speed.
Information	Student data and financial information are stored in separate systems, which often leads to difficulties in obtaining information. Non-integrated data can lead to duplication of information and errors in disbursement of funds.	An integrated system directly links student data with financial data, providing consistent and accurate information. Scholarship managers and financial officers can access data more easily and quickly, and monitor the status of fund disbursement in <i>real-time</i> .
Economy	Manual systems require a lot of operational costs, such as printing costs, physical storage of data, and large amounts of labor time for verification and disbursement of funds. In addition, errors in the manual process can lead to additional costs due to correction or cancellation of disbursements.	The use of digital technology reduces operational costs, especially in terms of data storage, information processing, and fund distribution. <i>Cloud-based</i> systems reduce the need for physical infrastructure, and automation reduces reliance on manual labor, making it more cost-efficient.
Control	Data management is done separately and lacks effective control mechanisms. The disbursement process often lacked a clear audit trail, which could lead to funding errors or even potential <i>double funding</i> .	The new system comes with an automated validation feature that prevents double funding and errors in disbursement. The system has an audit trail that enables transparent monitoring and checking of transactions. Control over fund distribution and scholarship utilization is more assured.
Efficiency	The administrative process, from registration to fund disbursement, is done manually and separately, which leads to repetition of the same tasks and increases workload. This leads to inefficiencies in scholarship management.	An integrated digital system improves efficiency by automating the verification, data processing, and fund disbursement processes. Users only need to enter data once, and the system automatically processes it without having to repeat the same steps. This reduces the time and effort required at each stage.
Service	Services provided to students and scholarship managers are limited to manual management and communication is often slow. Students have to wait for manual verification which is time-consuming and less transparent.	With a digital-based system, students can access information directly through a platform that provides fund disbursement status and automatic notifications. Scholarship managers can provide more responsive and transparent services, and allow students to monitor the progress of the process in <i>real-time</i> .

Source: Data Processed, 2025

The transformation of the UNNES scholarship administration system from a manual process to a PIECES-based digital system showed significant improvements in all aspects. In the Performance aspect, the old system experienced performance bottlenecks due to slow and error-prone manual processes. The new digitally integrated system allows real-time data processing, accelerates fund disbursement, and improves verification accuracy. In terms of Information, the previous system stored data separately between student and financial data, resulting in access difficulties and potential duplication. The new system overcomes this problem with data integration, making information more consistent, accessible, and accurate. In terms of economy, the manual system resulted in high-cost burdens such as document printing, physical storage, and labor. The implementation of a cloud-based digital system reduces the need for operational costs and improves the efficiency of managing scholarship funds. For the Control aspect, the previous system lacked strong monitoring and auditing mechanisms, making it prone to double funding or disbursement errors (El-majid et al., 2025). The new system is equipped with automatic validation and audit trail, which strengthens transparency and accountability of fund distribution. On the Efficiency dimension, the manual system caused repetition of work and burdened managers. The new system automates the entire administrative process, speeding up workflow and reducing operational burden. Finally, from the Service aspect, manual services tend to be slow and less transparent. The digital system allows students to monitor their scholarship status independently and in real-time, and provides access to more responsive communication from scholarship managers. The overall analysis shows that the adoption of the digital system significantly strengthens the principle of good accountability through increased transparency, efficiency, internal control, and better public service. This reflects a shift in UNNES scholarship governance towards a more modern, accountable, and data-driven system.

The results of the evaluation of the UNNES scholarship system based on the PIECES framework show that in general the system has succeeded in increasing user satisfaction, especially in the aspects of economy, control, efficiency, and service. This is in line with the findings of Karim et al. (2024) who designed a digital-based Bidikmisi scholarship monitoring and evaluation system and found that the digital system was able to speed up the process of verification and disbursement of funds, and reduce dependence on error-prone manual processes. On the economic aspect, the UNNES system showed the highest score due to the cost efficiency generated through service digitization. This finding is reinforced by Gunawan et al. (2018) in the development of the PIP scholarship system, which states that the online system cuts operational costs and increases administrative efficiency. The use of cloud computing and integrated databases is also considered capable of reducing institutional overhead and strengthening supervision of scholarship distribution.

However, the relatively low value in the aspects of performance and information is an important note that is also found in the research of Rahmawati et al., (2021), who implemented the waterfall model in developing a student achievement monitoring system. They highlight that system speed and information reliability are highly dependent on initial

planning and regular system maintenance. The IPA results that place the performance and information dimensions as *low priority* reflect the *expectation gap*, where users feel that they have not received an optimal experience in terms of access speed, system stability, and accurate and real-time data presentation. In fact, in the context of data-based decision making, the reliability of information systems determines transparency and public accountability, as described in the information system evaluation model by DeLone & McLean, which places system quality and information quality as the main determinants of information system success. The low scores in the Performance and Information aspects should be prioritized as key areas for strategic improvement, as they directly influence the responsiveness, accuracy, and transparency of scholarship services. Strengthening these dimensions through system optimization, real-time data synchronization, and enhanced server capacity will significantly improve user trust and operational reliability. Therefore, future development of the UNNES scholarship system should focus on upgrading its technical performance and information quality to ensure sustainable accountability and service excellence.

Furthermore, the importance of system integration and performance improvement has also been the focus of several scholarship selection system development studies. Research by Irmansyah et al. (2024) who applied the MOORA method and Faiz (2020) who used the SAW-TOPSIS method emphasized that the decision support system must be supported by an informative interface and responsive infrastructure to make the selection process transparent and fair. Similarly, Anggun et al. (2023) in developing a SMART-based scholarship selection system found that the quality of the system greatly affects the level of user confidence. In relation to UNNES' findings, the digital-based system has indeed shown great improvement from the previous manual system (Table 7), but to achieve the principle of good accountability as a whole, improving system stability and speed of information presentation is still a strategic improvement agenda. In other words, an accountable scholarship system is not only about budget efficiency, but also about how the system can guarantee transparency, speed, and accessibility of information for all parties fairly and equally, as suggested by Oriza & Hanita (2022) in their analysis of the LPDP scholarship program.

CONCLUSION

Strengthening the administration system of scholarship data collection based on digital services at Universitas Negeri Semarang (UNNES) has succeeded in improving the quality of scholarship program management, especially in the aspects of cost efficiency, service speed, and transparency of fund management. Based on the PIECES analysis, all variables received a "Satisfied" predicate, with the *Economic* variable recording the highest score for reducing operational costs and speeding up the administrative process. However, the lowest scores in the *Performance* and *Information* aspects indicate that technical challenges such as system stability and speed of information presentation are still obstacles in realizing the principles of good accountability as a whole. These results reinforce

previous findings that the digitization of scholarship information systems can provide significant benefits, but needs to be accompanied by ongoing system maintenance and improved quality of user services.

The policy implications of these findings include the importance of institutions such as UNNES to strengthen digital infrastructure and increase system capacity to be able to handle high user demand stably and quickly. Comprehensive integration of academic and financial data needs to be standardized in scholarship management policies to speed up the verification process and avoid fund distribution errors. The government and scholarship managers also need to implement a robust digital audit system, including *audit trail* and automated validation features, to ensure accountability and prevent potential irregularities such as double funding. On the other hand, improving transparency and user service through automatic notifications, real-time monitoring of scholarship status, and provision of responsive technical assistance should be part of digital-based public service policies. This model of scholarship system digitization at UNNES can also be replicated nationally as part of efforts to strengthen efficient, transparent, and accountable scholarship governance in order to improve the competitiveness of human resources in Indonesia.

REFERENCES

- Abd Karim, A. A., Sopyan, A., & Ali, I. (2024). Rancang Bangun Sistem Informasi Monitoring Dan Evaluasi Bidikmisi Di Sma Negeri 20 Kabupaten Tangerang. *Device*, 14(1), 38-47.
- Alita, D., Sari, I., Isnain, A. R., & Styawati, S. (2021). Penerapan Naïve Bayes Classifier Untuk Pendukung Keputusan Penerima Beasiswa. *Jurnal Data Mining Dan Sistem Informasi*, 2(1), 17-23.
- Anggun, N. A., Harifuddin, H., & Tandirerung, V. A. (2023). Pengembangan Sistem Informasi Pengambilan Keputusan Seleksi Penerimaan Beasiswa Menggunakan Metode SMART. *Jurnal MediaTIK*, 1-7.
- Basri, B. (2017). Metode Weightd Product (Wp) Dalam Sistem Pendukung Keputusan Penerimaan Beasiswa Prestasi. *Jurnal Insypro (Information System And Processing)*, 2(1).
- El-Majid, S. E., Khafid, M., & Yulianto, A. (2025). Effectiveness Of Powtoon As Learning Media To Improve High School Students'accounting Learning Outcomes. *Journal of Economic Education*, 14(1), 124-132.
- Fahmi, M. Y., & Indahyanti, U. (2024). Sistem informasi perekrutan karyawan di rumah sakit menggunakan metode analisis pieces. *Journal of Internet and Software Engineering*, 1(1), 23-23.
- Faiz, A. (2020). Pengembangan Sistem Pendukung Keputusan Untuk Seleksi Penerimaan Beasiswa Dengan Metode Saw Dan Topsis: Studi Kasus Universitas Muhammadiyah Tangerang. *JIKA (Jurnal Informatika)*, 4(1), 49-59.
- Gunawan, R. D., Oktavia, T., & Borman, R. I. B. I. (2018). Perancangan Sistem Informasi Beasiswa Program Indonesia Pintar (PIP) Berbasis Online (Tudi Kasus: SMA N 1 Kota Bumi). *MIKROTIK: Jurnal Manajemen Informatika*, 8(1), 43-54.
- Irmansyah, T. B. W., Bachri, O. S., & Irawan, B. (2024). Perancangan Sistem Pendukung Keputusan Seleksi Penerima Beasiswa dengan Pendekatan Metode MOORA Berbasis Web. *Jurnal Sains dan Informatika*, 10(1), 1-10.

- Iqram, I., Sari, C. R., & Saleh, A. (2024). Sistem Informasi Pendataan Penerima Beasiswa Kip Berbasis Geografis. In *Journal Pegguruang: Conference Series* (Vol. 6, No. 2, pp. 821-825).
- Kabelen, J., De Lemos, E., Keko, Y. L., Lodan, A., Ahmadi, N., Wisang, B., & Rihi, F. (2024). Pengembangan Sistem Crowdfunding Berbasis Web Menggunakan Metode Object Oriented Technology Sebagai Solusi Pendanaan Bagi Video Creator Dalam Produksi Film Pendek. *Jurnal Pengembangan dan Adopsi Teknologi Informasi*, 1(2), 55-61.
- Kalua, A. L., Mantiri, R., Rumondor, C., & Mogogibung, E. (2024). Sistem Informasi Pendaftaran Beasiswa dan Jadwal Legalisir Berbasis Website Responsif (Studi Kasus: Dinas Pendidikan Sulawesi Utara). *Journal of Information Technology, Software Engineering and Computer Science*, 2(2), 58-74.
- Khasanah, F. N., & Rofiah, S. (2019). Sistem Seleksi Penerimaan Beasiswa Menggunakan Metode Pendukung Keputusan Simple Additive Weighting. In *Seminar Nasional APTIKOM (SEMNASTIK)* (pp. 118-125).
- Muqorobin, M., Apriliyani, A., & Kusriani, K. (2019). Sistem Pendukung Keputusan Penerimaan Beasiswa dengan Metode SAW. *Respati*, 14(1).
- Nurwegiono, M., Nurdianti, S., & Wijaya, S. H. (2020). Pengembangan Sistem Manajemen Pengetahuan di Organisasi Asosiasi Alumni Program Beasiswa Amerika-Indonesia (ALPHA-I). *Jurnal Teknologi Informasi dan Ilmu Komputer (JTIIK)*, 7(3).
- Oktavia, P. (2018). Sistem Pendukung Keputusan Seleksi Penerima Beasiswa dengan Metode Weighted Product pada SMP Negeri 1 Parung Berbasis Web. *Jurnal Informatika Universitas Pamulang*, 3(2), 80-86.
- Oriza, M., & Hanita, M. (2022). Analisis Pengembangan Program Beasiswa Lembaga Pengelola Dana Pendidikan (Lpdp) Dalam Meningkatkan Kualitas Dan Ketahanan Sumber Daya Manusia Guna Menghadapi Megatren Abad Ke 21. *Journal Of Syntax Literate*, 7(6).
- Rahmawati, D., Prabowo, A. S., & Purwanto, R. (2021). Implementasi Model Waterfall pada Pengembangan Sistem Informasi Monitoring Prestasi Mahasiswa. *Journal of Innovation Information Technology and Application (JINITA)*, 3(1), 82-93.
- Ranggono, A., Haerullah, H., & Sipayung, M. S. (2023). Penerapan Metode Simple Additive Weighting Pada Sistem Pendukung Keputusan Pemberian Beasiswa di SMP Budi Luhur. *Jurnal Rekayasa Teknologi Informasi (JURTI)*, 7(1), 86-95.
- Sanatang, S., & Massikki, M. (2021). Pengembangan Sistem Informasi Beasiswa Berbasis Web Pada Jurusan Teknik Informatika Dan Komputer Ft Unm. *Jurnal Media Elektrik*, 18(3), 111-116.
- Saputra, F. I., & Maulani, M. R. (2023). Perancangan Aplikasi Sistem Pendukung Keputusan Penerimaan Beasiswa Menggunakan Metode Saw. *Jurnal Teknik Informatika*, 15(3), 133-138.
- Wang, V. V., Sukamto, A. S., & Pratama, E. E. (2019). Sistem Pendukung Keputusan Seleksi Mahasiswa Penerima Beasiswa BBP-PPA dengan Metode TOPSIS pada Fakultas Teknik UNTAN. *JUSTIN (Jurnal Sistem Dan Teknologi Informasi)*, 7(2), 105-112.
- Wirawan, R. (2019). Mendorong peningkatan daya saing sumber daya manusia kalimantan timur melalui seminar beasiswa wish festival & education expo. *Plakat: Jurnal Pelayanan Kepada Masyarakat*, 1(1), 27-37.
- Wijaya, Titis Wisnu., Sella Fadia Septariani., Muhammad Miftah. (2025). Implementation Of the Tonglis Web-Based Learning Application To Improve English Vocabulary Mastery In Elementary School Students. *Journal of Elementary Education*, Vol. 6 No. 2 (2025).