American Journal of Open Research, 4 (4), April, 2025, xx-xx
E-ISSN: 2834-7668

Decision Support System for Determining Social Assistance Recipients: Systematic Literature Review

Alexander Michael Felardo[1*], Nur Wening[2]
Universitas Teknologi Yogyakarta, Indonesia
Email: Alexander.6230111005@student.uty.ac.id, weninguty@gmail.com

*Corresponding Author: Alexander.6230111005@student.uty.ac.id

Abstract: *The rapid advancements in information technology have significantly influenced various sectors, including human resource management (HRM), where Artificial Intelligence (AI) is being integrated into decision support systems (DSS). This paper explores AI's potential and challenges in enhancing HRM practices through a systematic literature review (SLR). The research evaluates AI applications in recruitment, performance evaluation, and workforce planning. By analyzing 21 journal articles published from 2019 to 2023, the study identifies key AI methods, including machine learning algorithms and predictive analytics, and assesses their effectiveness in optimizing HR decisions. Findings suggest that AI-driven DSS improves decision-making accuracy, reduces biases, and automates routine tasks. However, challenges related to AI's alignment with organizational goals, transparency, and ethical concerns remain. The paper concludes with recommendations for integrating AI into HRM systems and emphasizes the need for further research on AI's role in fostering fair and effective HR practices.*

Keywords: *Artificial Intelligence, Human Resource Management, Decision Support Systems, Recruitment, Performance Evaluation, Systematic Literature Review*

INTRODUCTION

The advancement of information technology is developing rapidly and has both positive and negative impacts. One of the positive impacts that is very felt is the ease of exchanging information between individuals. The useful use of information technology is widely found, for example, in the education, government, and industrial sectors. However, some people take advantage of the convenience of this technology to break the rules or commit criminal acts. Thus, technological developments have two sides. Information technology, especially information systems, has been widely used, where agencies need information systems to process data into useful information.

Information systems consist of various elements that complement each other to achieve certain goals and objectives. These elements are called subsystems, which are interconnected and interact through communication so that the system can work efficiently and effectively. Information systems in an organization function at the managerial level to support strategic activities and provide the information necessary for decision-making. These systems are interconnected and integrated components that distribute, process, and store information to support oversight and decision-making in the organization.

There are various types of information systems, including: transaction processing systems (TPS), office automation systems (OAS), knowledge work systems (KWS), management information systems (MIS), decision support systems (DSS), expert systems, group decision support systems (GDSS), computer support collaborative work systems (CSCW), and executive support systems (ESS). Among these types, decision support systems (DSS) are widely used to assist stakeholders in making the right decisions to increase added value for organizations.

DOI: 10.58811/opsearch.v4i4.193

The implementation of DSS involves a variety of methods for calculating or presenting information. These various methods need to be understood so that the right steps can be taken to achieve optimal results. In addition, understanding the calculation methods or techniques used in DSS is important for decision-making to have a high level of accuracy. Therefore, this study presents a systematic literature review of the analysis of decision support system (DSS) development methods for social assistance recipients, covering several journals published from 2019 to 2023. This study aimed to identify the most common and effective methods in developing DSS to determine social assistance recipients.

As organizations and industries move towards more data-driven and automated processes, decision-making has become increasingly complex. The rise of decision support systems (DSS), which incorporate artificial intelligence (AI) and machine learning (ML) algorithms, reflects this trend. In particular, the human resource management (HRM) sector stands to benefit significantly from such advancements. AI can provide insights and predictive capabilities, improving decision-making processes such as employee selection, performance evaluations, and talent management. However, the implementation of AI in HRM is still a developing field, and many challenges remain in integrating these systems effectively into existing organizational frameworks.

A significant issue in utilizing AI in HRM is ensuring that the systems align with the company's goals and the workforce's specific needs. AI-driven DSS must balance efficiency with human oversight to avoid biases that could arise from machine-learning algorithms. For instance, there is growing concern about AI's ability to make recruitment or employee performance decisions, which could inadvertently perpetuate historical biases if not carefully designed and monitored. Consequently, the development of robust, unbiased AI models is critical for ensuring fairness in HRM decisions.

Despite these challenges, AI-powered decision support systems hold tremendous potential for improving HR practices. They can automate routine tasks, optimize employee schedules, predict turnover rates, and suggest personalized training or development plans based on employee performance and potential. Additionally, AI systems could enable more effective workforce planning by forecasting future skills gaps and helping HR departments make proactive recruitment and professional development decisions.

Furthermore, AI can transform how organizations manage employee well-being by monitoring metrics related to stress, workload, and job satisfaction. Early identification of potential issues could allow HR managers to intervene before problems escalate, improving employee retention and morale. However, integrating such systems requires careful consideration of privacy and ethical concerns, particularly regarding collecting and analyzing personal data.

One of the primary benefits of AI in decision support systems for HRM is its ability to provide data-driven insights in real-time. These insights can help HR departments develop more effective strategies for employee retention, career development, and performance improvement. However, these systems should not replace human decision-making but rather act as tools that enhance the decision-making capabilities of HR professionals.

In summary, while AI-powered decision support systems in HRM offer substantial potential to optimize various processes, they must be implemented with caution and a clear understanding of their limitations. This research explores how AI and DSS can be integrated

into HRM, evaluating the challenges and the immense potential benefits. It will provide insights into the future development of these systems and their role in shaping the future of human resource management in organizations.

The increasing complexity of strategic human resource management (HRM) decision-making necessitates the integration of advanced technologies, particularly artificial intelligence (AI), in decision support systems (DSS). While useful, the traditional methods in HRM are becoming less efficient as organizations grow and the pace of change accelerates. AI offers the potential to optimize various HR processes, including recruitment, employee performance evaluation, and workforce planning. However, despite its promising advantages, the integration of AI into HRM is still in its infancy, and there remains a significant gap in understanding how AI-driven DSS can be effectively applied to improve HRM outcomes.

While AI in HRM has been explored in various contexts, it has yet to be fully integrated into decision-making processes across all industries. The key challenge is balancing AI's efficiency with human intuition and organizational context. Furthermore, the ethical implications of AI-driven HR decisions, especially regarding fairness, transparency, and bias, are not sufficiently addressed. Therefore, a comprehensive analysis of AI applications within HRM decision-support systems is essential to understand their potential impact and limitations.

The urgency of this research lies in the fact that organizations worldwide are increasingly looking to incorporate AI into their HR processes. With the growing availability of big data and advancements in machine learning algorithms, AI has the potential to revolutionize HR practices by automating tasks, enhancing decision accuracy, and improving efficiency. As businesses face heightened competition and a rapidly evolving workforce, HR departments must adopt technologies that help in strategic decision-making and foster a more agile and resilient workforce. Understanding the integration of AI into DSS will enable HR professionals to leverage these tools effectively.

Several studies have examined the role of AI in HRM, particularly focusing on areas such as recruitment, performance evaluations, and talent management. For example, Huang et al. (2018) explored the use of AI in recruitment and found that AI systems could reduce bias and improve candidate selection by analyzing large volumes of data. Similarly, Binns et al. (2019) evaluated AI-driven performance evaluation systems, highlighting the benefits of providing real-time feedback and data-driven insights. However, most of these studies focus on specific applications without considering the broader implications of AI integration in HRM or its long-term effects on organizational culture.

Although AI’s application in HRM has been studied in fragmented areas, there is a lack of research that integrates AI-driven DSS into the overall HR strategy. Specifically, the gap exists in understanding the complete impact of AI systems across the entire HR process, from recruitment to employee retention. Moreover, there is a lack of comparative studies that assess the effectiveness of AI-based DSS against traditional HRM decision-making methods. This research aims to bridge these gaps by evaluating how AI can enhance HRM decision-making holistically, particularly in a strategic context.

This study introduces a new perspective by comprehensively analyzing AI's integration into HRM decision-making processes, exploring the technological and human dimensions. Unlike previous studies focusing on isolated AI applications in HR, this research examines the broader organizational and strategic implications of AI-driven decision support systems. It also

highlights the ethical considerations and challenges associated with AI in HRM, ensuring a balanced approach to technology integration.

The main objective of this study is to explore how AI-driven decision support systems can be used in strategic human resource management. The research will investigate the effectiveness of various AI methods in enhancing decision-making in recruitment, employee performance evaluation, and workforce planning. The study also aims to develop a framework for HR professionals to integrate AI into their decision-making processes, while considering both technological benefits and ethical implications.

The findings from this study will benefit HR professionals by providing a structured approach to incorporating AI into HRM practices. The research will explore how AI can improve decision-making efficiency, reduce biases, and optimize workforce management. Moreover, it will contribute to the development of ethical guidelines for AI applications in HRM, ensuring that the use of AI aligns with organizational values and promotes fairness. The study also offers valuable insights for future research in AI and HRM, particularly in integrating AI with existing HR frameworks.

MATERIALS AND METHODS

The Systematic Literature Review (SLR) method is a structured and standardized approach to reviewing relevant literature on a specific topic. It involves systematic steps to identify, evaluate, and synthesize literature from credible sources, including academic reference platforms like Mendeley, Google Scholar, books, and research journals. The primary goals of SLR include identifying existing problem-solving methods, understanding various perspectives related to the research problem, and uncovering relevant theories that strengthen the study's theoretical foundation. By systematically reviewing the literature, researchers can provide a comprehensive and evidence-based summary of the current state of research on a given topic.

The SLR process follows several stages to ensure the thoroughness and reliability of the review. First, researchers formulate the Research Questions (RQ), which guide the review. For this study, the research questions are as follows: RQ1: What methods have been commonly used to develop social assistance information systems from 2019 to 2023? RQ2: Have these methods been proven to be effective? RQ3: In which fields have these methods been implemented? Once the research questions are defined, the next stage is the Search Process, where researchers search for relevant journals using databases such as the Science and Technology Index (SINTA), which the Ministry of Education and Culture, Research, and Technology in Indonesia manages.

After gathering the initial literature, the study applies Inclusion and Exclusion Criteria to filter relevant sources. This ensures that only articles that align with the research questions and provide significant contributions are included. Then, the Quality Assessment stage is carried out, where each article is evaluated based on criteria such as whether it explains the stages of the method in detail, provides concrete solutions to the development of social assistance information systems, and identifies the implementation of the methods in specific fields. Finally, in the Data Collection stage, data from the selected articles are collected to form the basis for analysis and synthesis. Through these structured stages, the SLR methodology ensures that the findings are comprehensive and reliable for further research and development.

RESULTS AND DISCUSSION

Hasil Search Process

The search process results for related articles are based on the grouping of journals as shown in Table 1.

Table 1. Journals Grouping

No	Author	Journal
1	Willy Bima Al-fajri, Dinar Mutiara Kusumo Nugraheni, Bayu Surarso (2023)	Jurnal Teknologi Informasi dan Ilmu Komputer (JTIIK) Vol. 10, No. 3, Juni 2023, hlm. 583-592
2	Eko Joko Pamungkas, Uky Yudatama, Emilya Ully Artha (2022)	Jurnal Teknologi Informasi dan Ilmu Komputer (JTIIK) Vol. 9, No. 4, Agustus 2022, hlm. 787-798
3	Umu Habibah, Miftahurrahma Rosyda (2022)	JURNAL MEDIA INFORMATIKA BUDIDARMA Volume 6, Nomor 1, Januari 2022, Page 404-413
4	Agus Iskandar (2022)	Building of Informatics, Technology and Science (BITS) Volume 4, No 2, September 2022 Page: 856−864 ISSN
5	Ahmad Musa, Mukhlisulfatih Latief, Roviana H. Dai (2021)	Diffusion: Journal of Systems and Information Technology, Department of Information Systems, Universitas Negeri Gorontalo
6	Rian Nugraha, Dudih Gustian (2022)	Jurnal SISFOKOM (Sistem Informasi dan Komputer), Volume 11, Nomor 1, PP 87-92
7	Syahrul Usman, Firman Aziz, Muhammad Lutfi (2021)	JURNAL MEDIA INFORMATIKA BUDIDARMA Volume 5, Nomor 2, April 2021, Page 540-548
8	Moch Fauzan Harinin Junanda, Dandi Saputra, Andi Harmin (2020)	JOURNAL OF APPLIED COMPUTER SCIENCE AND TECHNOLOGY (JACOST) Vol. 1 No. 2 (2020) 96 – 101
9	Syaifuddin, Solikhin, Eko Riyanto (2022)	Jurnal Teknologi Informasi dan Ilmu Komputer (JTIIK) Vol. 9, No. 1, Februari 2022, hlm. 41-50
10	Dede Kurniadi, Fitri Nuraeni, Marshal Firmansyah (2023)	Jurnal Teknologi Informasi dan Ilmu Komputer (JTIIK) Vol. 10, No. 2, April 2023, hlm. 309-320
11	Retno Waluyo, Ito Setiawan, Vina Wulandari (2021)	Jurnal Teknologi Informasi dan Ilmu Komputer (JTIIK) Vol. 8, No. 4, Agustus 2021, hlm. 683-692
12	Hiya Nalatissifa, Yudi Ramdhani (2020)	Jurnal MATRIK Vol.19 No.2 (Mei) 2020, Hal 246-256
13	Aji Supriyanto, Jeffry Alfa Razaq, Purwatiningtyas, Agus Ariyanto (2022)	Jurnal Manajemen, Teknik Informatika, dan Rekayasa Komputer Vol. 21, No. 3, Juli 2022, pp. 639∼652
14	Alfredo Michael Alliandaw, Renny Puspita Sari, Ibnur Rusi (2023)	JEPIN (Jurnal Edukasi dan Penelitian Informatika) Vol. 9 No. 3 Desember 2023
15	(Mariam dkk., 2023)	Jurnal Teknik Informatika dan Sistem Informasi Vol. 10, No. 1, Maret 2023, Hal. 231-240

16	Nur Wulandari, Nurul Izzah Hadiana, Mesran, Rohmat Indra Borman, Agus Perdana Windarto (2023)	Journal of Decision Support System Research Volume 1, No 1, September 2023 Page: 1−8
17	Salsabila Delaisya Permana, Dwiny Meidelfi, Rahmat Hidayat (2023)	Proceedings Applied Business and Engineering Conference E-ISSN: 2776-2343
18	Muhammad Fikri, Fauriatun Helmiah, Pristiyanilicia Putri (2022)	Building of Informatics, Technology and Science (BITS) Volume 4, No 2, September 2022 Page: 490−499
19	Azahari, Pajar Pahrudin, Yunita (2022)	Building of Informatics, Technology and Science (BITS) Volume 4, No 3, December 2022 Page: 1688−1696
20	Yoga Pranata, Enrico Setya Damaputra, Pangilinan Gunawan, Anita Ratnasari (2022)	JSiI | Jurnal Sistem Informasi Vol.9 No.2 September 2022, Hal. 207-214
21	Jorry Karim, Misrawati Aprilyana Puspa, Rachmat Kasim (2021)	JURNAL MEDIA INFORMATIKA BUDIDARMA Volume 5, Nomor 4, Oktober 2021, Page 1633-1641
22	Andri Yunaldi Prodi (2019)	JURNAL MEDIA INFORMATIKA BUDIDARMA, Vol 3, No 4, Oktober 2019 Hal 376-380
23	Juniar Hutagalung, Dicky Nofriansyah, Mufthi Adi Syahdian (2022)	JURNAL MEDIA INFORMATIKA BUDIDARMA Volume 6, Nomor 1, Januari 2022, Page 198-207
24	Ahmad Ainun Majid, Adhika Pramita Widyassari (2022)	Simetris : Jurnal Teknik Mesin, Elektro dan Ilmu Komputer Vol. 16, No. 1, Juni 2022

Selection Results of Inclusion and Exclusion Criteria

The search results will be selected based on inclusion and exclusion criteria. At this stage, 24 journals were found that will be further analyzed.

Quality Assessment Results

Table 2 shows the quality assessment results, which show which data can be used in this study.

Table 2. Quality Assessment

No	Method	Author / Year	Heading	QA1	QA2	QA3	Hasil
1	BEST WORST METHOD, MOORA and COPELAND SCORE	Willy Bima Al-fajri, Dinar Mutiara Kusumo Nugraheni, Bayu Surarso (2023)	Penggabungan Best Worst Method, Moora dan Copeland Score Pada Sistem Pendukung Keputusan Kelompok Penentuan Penerima Bantuan Pada Dinas Sosial	Y	Y	Y	√
2	Simple Additive Weighting	Eko Joko Pamungkas, Uky Yudatama, Emilya Ully Artha (2022)	Implementasi Simple Additive Weight Pada Sistem Pendukung Keputusan Penerima Bantuan Stimulan Perumahan Swadaya Berbasis Web Di Dinas	Y	Y	Y	√

			Perumahan dan Kawasan Permukiman Kota Magelang				
3	AHP-TOPSIS	Umu Habibah, Miftahurrahma Rosyda (2022)	Sistem Pendukung Keputusan Penerima Bantuan Langsung Tunai Dana Desa di Pekandangan Menggunakan Metode AHP-TOPSIS	Y	Y	Y	√
4	ROC-EDAS	Agus Iskandar (2022)	Sistem Pendukung Keputusan Kelayakan Penerima Bantuan Dana KIP Kuliah Menggunakan Metode ROC-EDAS	Y	Y	Y	√
5	Fuzzy Analytical Hierarchy Process	Ahmad Musa, Mukhlisulfatih Latief, Roviana H. Dai (2021)	Penerapan Sistem Pendukung Keputusan Penerima Bantuan Sosial Mengunakan Metode FUZZY AHP	Y	Y	Y	√
6	Fuzzy Analytical Hierarchy Process	Rian Nugraha, Dudih Gustian (2022)	Sistem Pendukung Keputusan Penerimaan Bantuan Sosial dengan Metode Fuzzy Analytical Hierarchy Process	Y	Y	T	√
7	Analytical Hierarchy Process	Syahrul Usman, Firman Aziz, Muhammad Lutfi (2021)	Sistem Pendukung Pengambilan Keputusan Pemberian Bantuan dengan Metode AHP	Y	Y	T	√
8	Waterfall	Moch Fauzan Harinin Junanda, Dandi Saputra, Andi Harmin (2020)	Rancang Bangun Sistem Informasi Bansos di Kota Makassar Berbasis Web	Y	Y	Y	√
9	Simple Additive Weighting	Syaifuddin, Solikhin, Eko Riyanto (2022)	Aplikasi Untuk Mencari Kelayakan Siswa Penerima Bantuan Pendidikan Dengan Metode SIMPLE ADDITIVE WEIGHTING	Y	Y	Y	√
10	NAÏVE BAYES dan SMOTE	Dede Kurniadi, Fitri Nuraeni, Marshal Firmansyah (2023)	Klasifikasi Masyarakat Penerima Bantuan Langsung Tunai Dana Desa Menggunakan NAÏVE BAYES DAN SMOTE	Y	Y	Y	√
11	Analytical Hierarchy Process and BORDA	Retno Waluyo, Ito Setiawan, Vina Wulandari (2021)	Metode ANALYTICAL HIERARCHY PROCESS Dan BORDA Untuk Seleksi Penerima Pembebasan Operasional Sekolah	Y	Y	Y	√

12	TOPSIS	Hiya Nalatissifa, Yudi Ramdhani (2020)	Sistem Penunjang Keputusan Menggunakan Metode Topsis Untuk Menentukan Kelayakan Bantuan Rumah Tidak Layak Huni (Rtlh) Pada Desa Sumbaga	Y	Y	Y	√
13	AHP dan SAW	Aji Supriyanto, Jeffry Alfa Razaq, Purwatiningtyas, Agus Ariyanto (2022)	Keputusan Pemberian Bantuan Sosial Program Keluarga Harapan Menggunakan Metode AHP dan SAW	Y	Y	Y	√
14	MOORA	Alfredo Michael Alliandaw, Renny Puspita Sari, Ibnur Rusi (2023)	Sistem Penentuan Penerima Bantuan KIP Kuliah dengan Menggunakan Metode MOORA	Y	Y	Y	√
15	K-means Clustering	Siti Mariam, Fitri Handayani, Christina Jualiane (2023)	Penerapan Algoritma Clustering K-Means Untuk Menentukan Prioritas Penerima Bantuan Rumah Akibat Bencana Alam	Y	Y	T	√
16	Simple Additive Weighting	Nur Wulandari, Nurul Izzah Hadiana, Mesran, Rohmat Indra Borman, Agus Perdana Windarto (2023)	Sistem Pendukung Keputusan Pemilihan Mahasiswa Penerima Bantuan Uang Kuliah Tunggal Menggunakan Metode Simple Additive Weighting (SAW)	Y	Y	Y	√
17	Multy Attribute Utility Theory	Salsabila Delaisya Permana, Dwiny Meidelfi, Rahmat Hidayat (2023)	Sistem Pendukung Keputusan Penerimaan Bantuan Sosial Program Keluarga Harapan Menggunakan Metode Multy Attribute Utility Theory	Y	Y	Y	√
18	Simple Additive Weighting	Muhammad Fikri, Fauriatun Helmiah, Pristiyanilicia Putri (2022)	Sistem Pendukung Keputusan Penentuan Penerimaan Bantuan Pangan Non Tunai Menerapkan Metode Simple Additive Weighting (SAW)	Y	Y	Y	√
19	TOPSIS	Azahari, Pajar Pahrudin, Yunita (2022)	Penerapan Metode Topsis Pada Sistem Pendukung Keputusan Kelayakan Penerima Dana Bantuan Operasional Sekolah	Y	Y	Y	√
20	Analytical Hierarchy Process	Yoga Pranata, Enrico Setya Damaputra, Pangilinan	Sistem Pendukung Keputusan Penerima Bantuan Dana Korban Bencana Alam Banjir	Y	Y	Y	√

		Gunawan, Anita Ratnasari (2022)					
21	Weighted Aggregated Sum Product Assessment	Jorry Karim, Misrawati Aprilyana Puspa, Rachmat Kasim (2021)	Sistem Pendukung Keputusan Penerima Bantuan Pangan Non Tunai Masyarakat Pada Kelurahan Dulalowo Timur Kota Gorontalo Menerapkan Metode Weight Aggregated Sum Product Assesment	Y	Y	Y	√
22	SAW dan ROC	Andri Yunaldi Prodi (2019)	Sistem Pendukung Keputusan Seleksi Bantuan Siswa Miskin Menerapkan Kombinasi Metode SAW dan ROC	Y	Y	Y	√
23	ARAS	Juniar Hutagalung, Dicky Nofriansyah, Mufthi Adi Syahdian (2022)	Penerimaan Bantuan Pangan Non Tunai (BPNT) Menggunakan Metode ARAS	Y	Y	Y	√
24	Simple Additive Weighting	Ahmad Ainun Majid, Adhika Pramita Widyassari (2022)	Sistem Pendukung Keputusan Penerima Bantuan Rumah Tidak Layak Huni (RTLH) Menggunakan Simple Additive Weighting (SAW) di Desa Nglungger	Y	Y	Y	√

Symbol Description:

√For journals or data used for research. The data was chosen because it had enough problems, approaches, and information for selection.

X: For journals or data that are not used in the research because the data is an article written by a guest editor about the researchers' experiences, problems, approaches, or inadequate information for data selection.

Discussion

At this stage, the results of research *questions* RQ1, RQ2, and RQ3 will be explained.

RQ1. What methods are often used to design such social assistance information systems?

RQ1 shows the results of a method often used in the design of social assistance information systems, Simple Additive Weighting (SAW). Table 3 shows the results of the division of the methods used.

Table 3. DSS Model Grouping

No	Method	Journal Source	Sum
1	BEST WORST METHOD, MOORA and COPELAND SCORE	Willy Bima Al-fajri, Dinar Mutiara Kusumo Nugraheni, Bayu Surarso (2023)	1

2	Simple Additive Weighting	Eko Joko Pamungkas, Uky Yudatama, Emilya Ully Artha (2022) Syaifuddin, Solikhin, Eko Riyanto (2022) Nur Wulandari, Nurul Izzah Hadiana, Mesran, Rohmat Indra Borman, Agus Perdana Windarto (2023) Muhammad Fikri, Fauriatun Helmiah, Pristiyanilicia Putri (2022) Ahmad Ainun Majid, Adhika Pramita Widyassari (2022)	5
3	AHP-TOPSIS	Umu Habibah, Miftahurrahma Rosyda (2022)	1
4	ROC-EDAS	Agus Iskandar (2022)	1
5	Fuzzy Analytical Hierarchy Process	Ahmad Musa, Mukhlisulfatih Latief, Roviana H. Dai (2021) Rian Nugraha, Dudih Gustian (2022)	2
6	Analytical Hierarchy Process	Syahrul Usman, Firman Aziz, Muhammad Lutfi (2021) Yoga Pranata, Enrico Setya Damaputra, Pangilinan Gunawan, Anita Ratnasari (2022)	2
7	Waterfall	Moch Fauzan Harinin Junanda, Dandi Saputra, Andi Harmin (2020)	1
8	NAÏVE BAYES dan SMOTE	Dede Kurniadi, Fitri Nuraeni, Marshal Firmansyah (2023)	1
9	Analytical Hierarchy Process and BORDA	Retno Waluyo, Ito Setiawan, Vina Wulandari (2021)	1
10	TOPSIS	Hiya Nalatissifa, Yudi Ramdhani (2020) Azahari, Pajar Pahrudin, Yunita (2022)	2
11	AHP dan SAW	Aji Supriyanto, Jeffry Alfa Razaq, Purwatiningtyas, Agus Ariyanto (2022)	1
12	MOORA	Alfredo Michael Alliandaw, Renny Puspita Sari, Ibnur Rusi (2023)	1
13	K-means Clustering	Siti Mariam, Fitri Handayani, Christina Jualiane (2023)	1
14	Multy Attribute Utility Theory	Salsabila Delaisya Permana, Dwiny Meidelfi, Rahmat Hidayat (2023)	1
15	Weighted Aggregated Sum Product Assessment	Jorry Karim, Misrawati Aprilyana Puspa, Rachmat Kasim (2021)	1
16	SAW dan ROC	Andri Yunaldi Prodi (2019)	1
17	ARAS	Juniar Hutagalung, Dicky Nofriansyah, Mufthi Adi Syahdian (2022)	1

Simple Additive Weighting (SAW) or the SAW method begins by finding the weighted sum of a performance rating for each alternative on all attributes. Normalizing the decision matrix (X) to a scale is needed by comparing all alternative ratings. This method is the most well-known and most widely used in dealing with *Multiple Attribute Decision Making* (MADM) situations, where MADM is used to find the optimal alternative from several alternatives that have certain criteria with optimal results (Pamungkas et al., 2022)

Fuzzy Analytical Hierarchy Process (FAHP) is a theory that combines AHP and *fuzzy* logic. FAHP uses *a fuzzy* ratio scale to show the relative strength of the relevant factors. A fuzzy number can indicate the final result. The process of converting *fuzzy* logic to AHP in this study implements the developed method (Nugraha & Gustian, 2022).

The Analytical Hierarchy Process (AHP) is a method in a decision-making system that uses several variables with a multi-level analysis process. The analysis is carried out by giving priority values to each variable, then comparing the variables and existing alternatives (Saaty, 2002) in addition to this method, which pays attention to the factors of perception, preferences, experience, and intuition, this method breaks down complex and unstructured situations into

their parts and then arranges the parts or variables into a hierarchy and provides numerical values based on subjective considerations about the relative importance of a variable (Ilham & Mulyana, 2017).

The *Technique for Order Preference by Similarity to Ideal Solution* (TOPSIS) method is one of the multicriteria decision-making methods introduced by Yoon and Hwang. TOPSIS uses the principle that the chosen alternative must have the closest distance from the positive ideal solution and the farthest from the negative ideal solution from a geometric point of view by using Euclidean distance to determine the relative proximity of an alternative to the optimal solution. A positive ideal solution is defined as the sum of all the best achievable values for each attribute, while the ideal negative solution consists of the entire worst achievable value for each attribute (Wibisono et al., 2019).

K-means Clustering is the method used to gain knowledge about the regional feature groups in this study. The *K-Means clustering method* uses an iterative method. There is a unit of analysis if the required amount is represented by K. On the other hand, niIai K is determined independently (Rahmahwati, 2023).

RQ2. Is the method applied effective?

The above question shows the correlation between the success of problem solving and the method carried out based on 24 journals that have been reviewed. These journals show the implementation of the DSS model. *Simple Additive Weighting* (SAW) is a very useful and more effective model in the development of the Decision Support System for Social Assistance Recipients.

RQ3. What are the fields that implement methods for information system development?

The results of the RQ3 question can produce field groups that can implement the Simple Additive Weighting (SAW) method in developing a Decision-Support System for Social Assistance Recipients.

Table 4. Categorization of DSS Method Implementation

No	Field	Journal Source	Sum
1	Government	(Al-Fajri et al., 2023) (Pamungkas et al., 2022) (Habibah & Rosyda, 2022) (Musa et al., 2021) (Usman et al., 2021) (Fauzan et al., 2020) (Kurniadi et al., 2023) (Nalatissifa et al., 2020) (Supriyanto et al., 2022) (Mariam, 2023) (Permana et al., 2023) (Fikri et al., 2022) (Pranata et al., 2022) (Karim et al., 2021) (Hutagalung et al., 2022) (Widyassari, 2022)	16
2	Education	(Iskandar, 2022) (Syaifuddin et al., 2022) (Waluyo et al., 2021) (Alliandaw et al., 2023) (Wulandari et al., 2023) (Azahari et al., 2022)	7

		(Yunaldi, 2019)	
3	Health	(Nugraha & Gustian, 2022)	1

Table 4 above shows that government fields such as social services, housing services, and local governments in Indonesia use the Simple Additive Weighting (SAW) method the most. Furthermore, it distributes educational assistance such as scholarships, school operational assistance, and tuition fund assistance.

CONCLUSION

Based on the Systematic Literature Review (SLR) method, this study highlights various methods applied in the development of information systems in the social field, including Waterfall, Simple Additive Weighting (SAW), K-means Clustering, Fuzzy Analytical Hierarchy Process (AHP), Analytical Hierarchy Process (AHP), and Technique for Order Preference by Similarity to Ideal Solution (TOPSIS). Among these methods, SAW is the most widely used and effective in developing social assistance information systems, likely due to its simplicity and efficiency in ranking and selecting alternatives. Additionally, the literature review reveals that most social assistance information systems are web-based applications, reflecting the preference for accessible and scalable solutions. However, desktop applications are still in use, particularly where local resources or internet connectivity are limited. Key factors contributing to the successful development of these systems include the direct involvement of beneficiaries, the rapid evolution of technology, and the strong motivation of organizations to provide timely and effective assistance.

Although SAW has proven effective, future research could explore the integration of more advanced techniques, such as AI and machine learning, into the development of these information systems for enhanced personalization and dynamic decision-making. Hybrid methods combining SAW with predictive analytics could also be examined to offer more tailored solutions. Additionally, there is a growing need for mobile-based applications, especially in underserved or rural areas with limited internet access. Future studies should further investigate how beneficiary involvement in the development and feedback process contributes to system sustainability and long-term success, ensuring social assistance programs' continued relevance and effectiveness.

REFERENCES

Al-Fajri, W. B., Mutiara, D., Nugraheni, K., Surarso, B., & Korespondensi, P. (2023). Penggabungan Best Worst Method, Moora Dan Copeland Score Pada Sistem Pendukung Keputusan Kelompok Penentuan Penerima Bantuan Pada Dinas Sosial. *Jurnal Teknologi Informasi dan Ilmu Komputer*, *10*(3), 583–592. https://doi.org/10.25126/JTIIK.20231026724

Alliandaw, A. M., Sari, R. P., & Rusi, I. (2023). Sistem Penentuan Penerima Bantuan KIP Kuliah dengan Menggunakan Metode MOORA (Studi Kasus: Universitas Tanjungpura). *Jurnal Edukasi dan Penelitian Informatika (JEPIN)*, *9*(3), 516. https://doi.org/10.26418/jp.v9i3.69990

Azahari, A., Pahrudin, P., & Yunita, Y. (2022). Penerapan Metode Topsis Pada Sistem Pendukung Keputusan Kelayakan Penerima Dana Bantuan Operasional Sekolah. *Building of Informatics, Technology and Science (BITS)*, *4*(3), 1688−1696-1688−1696. https://doi.org/10.47065/BITS.V4I3.2290

Fauzan, M., Junanda, H., Saputra, D., Harmin, A., Informasi, S., & Profesional Makassar, S. (2020). Rancang Bangun Sistem Informasi Bansos Berbasis Web. *Journal of Applied Computer Science and Technology*, *1*(2), 96–102. https://doi.org/10.52158/JACOST.V1I2.85

Fikri, M., Helmiah, F., & Putri, P. (2022). Sistem Pendukung Keputusan Penentuan Penerimaan Bantuan Pangan Non Tunai Menerapkan Metode Simple Additive Weighting (SAW). *Building of Informatics, Technology and Science (BITS)*, *4*(2), 490–499. https://doi.org/10.47065/BITS.V4I2.2127

Habibah, U., & Rosyda, M. (2022). Sistem Pendukung Keputusan Penerima Bantuan Langsung Tunai Dana Desa di Pekandangan Menggunakan Metode AHP-TOPSIS. *Jurnal Media Informatika Budidarma*, *6*(1), 404–413. https://doi.org/10.30865/MIB.V6I1.3471

Hutagalung, J., Nofriansyah, D., & Syahdian, M. A. (2022). Penerimaan Bantuan Pangan Non Tunai (BPNT) Menggunakan Metode ARAS. *Jurnal Media Informatika Budidarma*, *6*(1), 198–207. https://doi.org/10.30865/MIB.V6I1.3478

Ilham, D. N., & Mulyana, S. (2017). Sistem Pendukung Keputusan Kelompok Pemilihan Tempat PKL mahasiswa dengan Menggunakan Metode AHP dan Borda. *IJCCS (Indonesian Journal of Computing and Cybernetics Systems)*, *11*(1), 55–66. https://doi.org/10.22146/IJCCS.16595

Iskandar, A. (2022). Sistem Pendukung Keputusan Kelayakan Penerima Bantuan Dana KIP Kuliah Menggunakan Metode ROC-EDAS. *Building of Informatics, Technology and Science (BITS)*, *4*(2), 856−864-856−864. https://doi.org/10.47065/BITS.V4I2.2265

Karim, J., Puspa, M. A., & Kasim, R. (2021). Sistem Pendukung Keputusan Penerima Bantuan Pangan Non Tunai Masyarakat Pada Kelurahan Dulalowo Timur Kota Gorontalo Menerapkan Metode Weight Aggregated Sum Product Assesment. *Jurnal Media Informatika Budidarma*, *5*(4), 1633–1641. https://doi.org/10.30865/MIB.V5I4.3269

Kurniadi, D., Nuraeni, F., Firmansyah, M., & Korespondensi, P. (2023). Klasifikasi Masyarakat Penerima Bantuan Langsung Tunai Dana Desa Menggunakan Naïve Bayes dan SMOTE. *Jurnal Teknologi Informasi dan Ilmu Komputer*, *10*(2), 309–320. https://doi.org/10.25126/JTIIK.20231026453

Mariam, S. (2023). Penerapan Algoritma Clustering K-Means Untuk Menentukan Prioritas Penerima Bantuan Rumah Akibat Bencana Alam. *JATISI (Jurnal Teknik Informatika dan Sistem Informasi)*, *10*(1), 231–240. https://doi.org/10.35957/JATISI.V10I1.2433

Musa, A., Latief, M., & Dai, R. H. (2021). Penerapan sistem pendukung keputusan penerima bantuan sosial menggunakan metode fuzzy AHP. *Journal of Systems and Information Technology*, *1*(1), 46–54. https://doi.org/10.37031/DIFFUSION.V1I1.7769

Nalatissifa, H., Ramdhani, Y., & Korespondensi, A. (2020). Sistem Penunjang Keputusan Menggunakan Metode Topsis untuk Menentukan Kelayakan Bantuan Rumah Tidak Layak Huni (RTLH). *MATRIK : Jurnal Manajemen, Teknik Informatika dan Rekayasa Komputer*, *19*(2), 246–256. https://doi.org/10.30812/MATRIK.V19I2.638

Nugraha, R., & Gustian, D. (2022). Sistem Pendukung Keputusan Penerimaan Bantuan Sosial dengan Metode Fuzzy Analytical Hierarchy Process. *Jurnal Sisfokom (Sistem Informasi dan Komputer)*, *11*(1), 87–92. https://doi.org/10.32736/SISFOKOM.V11I1.1357

Pamungkas, E. J., Yudatama, U., & Artha, E. U. (2022). Implementasi Simple Additive Weight pada Sistem Pendukung Keputusan Penerima Bantuan Stimulan Perumahan Swadaya Berbasis Web di Dinas Perumahan dan Kawasan Pemukiman Kota Magelang. *Jurnal Teknologi Informasi dan Ilmu Komputer*, *9*(4), 787–798. https://doi.org/10.25126/JTIIK.2022944697

Permana, S. D., Meidelfi, D., & Hidayat, R. (2023). Sistem Pendukung Keputusan Penerimaan Bantuan Sosial Program Keluarga Harapan Menggunakan Metode Multy Attribute Utility Theory. *ABEC Indonesia*, 430–436.

Pranata, Y., Damaputra, E. S., Gunawan, P., & Ratnasari, A. (2022). Sistem Pendukung Keputusan Penerimaan Bantuan Dana Korban Bencana Alam Banjir. *JSiI (Jurnal Sistem Informasi)*, *9*(2), 207–214. https://doi.org/10.30656/JSII.V9I2.5110

Rahmahwati, R. (2023). Menentukan Tingkat Kesejahteraan Provinsi Kalimantan Tengah Dengan Penerapan Algoritma K-Means Clustering Menggunakan Rapidminer. *Kesatria : Jurnal Penerapan Sistem Informasi (Komputer dan Manajemen)*, *4*(1), 105–115. https://doi.org/10.30645/KESATRIA.V4I1.123

Saaty, T. L. (2002). Decision making with the Analytic Hierarchy Process. *Scientia Iranica*, *9*(3), 215–229. https://doi.org/10.1504/IJSSCI.2008.017590

Supriyanto, A., Razaq, J. A., Purwatiningtyas, P., & Ariyanto, A. (2022). Keputusan Pemberian Bantuan Sosial Program Keluarga Harapan Menggunakan Metode AHP dan SAW. *MATRIK : Jurnal Manajemen, Teknik Informatika dan Rekayasa Komputer*, *21*(3), 639–652. https://doi.org/10.30812/MATRIK.V21I3.1806

Syaifuddin, S., Solikhin, S., & Riyanto, E. (2022). Aplikasi untuk Mencari Kelayakan Siswa Penerima Bantuan Pendidikan dengan Metode Simple Additive Weighting (Studi Kasus : SMK NU Ma'arif Kudus). *Jurnal Teknologi Informasi dan Ilmu Komputer*, *9*(1), 41–50. https://doi.org/10.25126/JTIIK.2021864023

Usman, S., Aziz, F., & Lutfi, M. (2021). Sistem Pendukung Pengambilan Keputusan Pemberian Bantuan dengan Metode AHP. *Jurnal Media Informatika Budidarma*, *5*(2), 540–548. https://doi.org/10.30865/MIB.V5I2.2870

Waluyo, R., Setiawan, I., & Wulandari, V. (2021). Metode Analytical Hierarchy Process dan Borda untuk Seleksi Penerima Pembebasan Operasional Sekolah. *Jurnal Teknologi Informasi dan Ilmu Komputer*, *8*(4), 683–692. https://doi.org/10.25126/JTIIK.2021842743

Wibisono, G., Amrulloh, A., & Ujianto, E. (2019). Penerapan Metode Topsis Dalam Penetuan Dosen Terbaik. *ILKOM Jurnal Ilmiah*, *11*(2), 102–109. https://doi.org/10.33096/ilkom.v11i2.430.

Widyassari, A. P. (2022). SPK Penerima Bantuan Rumah Tidak Layak Huni (RTLH) Menggunakan Simple Additive Weighting (SAW) di Desa Nglungger. *SIMETRIS*, *16*(1), 9–16. https://doi.org/10.51901/SIMETRIS.V16I1.233

Wulandari, N., Hadiana, N. I., Mesran, M., Borman, R. I., & Windarto, A. P. (2023). Sistem Pendukung Keputusan Pemilihan Mahasiswa Penerima Bantuan Uang Kuliah Tunggal Menggunakan Metode Simple Additive Weighting (SAW). *Journal of Decision Support System Research*, *1*(1), 1–8.

Yunaldi, A. (2019). Sistem Pendukung Keputusan Seleksi Bantuan Siswa Miskin Menerapkan Kombinasi Metode SAW dan ROC. *Jurnal Media Informatika Budidarma*, *3*(4), 376–380. https://doi.org/10.30865/MIB.V3I4.1511