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Decision Support System for Recommendation Sharia Banking Investment Products Using Simple Additive Weighting (SAW)

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Abstract

The swift expansion of Islamic banking has resulted in the creation of many investment products, such as mudharabah deposits, sukuk, and Islamic mutual funds, all compliant with sharia rules. Notwithstanding this advancement, the customers' inadequate financial literacy presents considerable obstacles in identifying appropriate investment alternatives that correspond with their objectives and risk appetite. This work seeks to fill this gap by creating a Decision Support System (DSS) that employs the Simple Additive Weighting (SAW) method to aid users in making educated decisions on Islamic banking investments. The SAW technique was selected for its straightforwardness and efficacy in normalizing data and assessing alternatives according to established criteria, including profit potential, risk level, investment duration, and compliance with sharia principles. The research encompassed multiple phases, including the identification of evaluation criteria, the collection and analysis of pertinent data, and the application of the SAW method to rank investment choices. The DSS effectively delivered precise and dependable suggestions, designating Sharia Deposits as the optimal investment choice due to its robust agreement with the established criteria. The results underscore the system's capability to improve financial inclusion and literacy, especially in Indonesia, where comprehension of sharia-compliant financial products is still inadequate. Future improvements to the DSS involve the incorporation of real-time data and the expansion of its application to include more financial industries, such as insurance and microfinance. This study highlights the importance of utilizing technology to address deficiencies in financial literacy and facilitate the sustainable development of the Islamic banking sector.

I. INTRODUCTION

Islamic banking has emerged as a significant industry within the global financial system, particularly due to its rapid expansion over the past few decades[1]. This financial system provides an alternative grounded in sharia principles that emphasizes justice, transparency, and the prohibition of usury[2]. The worldwide Islamic Finance Report (2023) indicates that the total assets of the worldwide Islamic finance sector have attained USD 3 trillion[3], reflecting its growing appeal and significance across many nations. In Indonesia, the nation with the biggest Muslim population globally, the advancement of sharia banking has exhibited a favorable trajectory. According to data from the Financial Services Authority (OJK), the market share of sharia banking is projected to attain 6.7% of total national banking assets in 2023[4].

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Nonetheless, despite these advancements, inadequate sharia financial knowledge and inclusiveness remain significant challenges[5]. The National Survey of Financial Literacy and Inclusion (2024) indicated that the Islamic financial literacy rate among Indonesians was at 12.88%, significantly lower than the conventional financial literacy rate of 65.43%[6]. This sometimes leads individuals to struggle with comprehending and selecting Islamic financial items, particularly regarding investment. Sharia investment instruments, including mudharabah deposits, sukuk, and sharia mutual funds, has distinct characteristics, dangers, and profit potential, necessitating thorough investigation to identify the most appropriate product[7].

Islamic banking has emerged as a significant industry within the global financial system, particularly due to its rapid expansion in recent decades [8]. This financial system provides an alternative grounded in sharia principles that emphasizes justice, transparency, and the prohibition of usury[9]. The worldwide Islamic financial Report (2023) indicates that the total assets of the worldwide Islamic financial sector have attained USD 3 trillion, demonstrating heightened appeal and significance across several nations[10]. In Indonesia, the nation with the biggest Muslim population globally, the advancement of sharia banking has exhibited a favorable trajectory. According to data from the Financial Services Authority (OJK), the market share of sharia banking is projected to attain 6.7% of total national banking assets in 2023[6].

This project seeks to create a decision support system utilizing the SAW approach to assess diverse sharia banking investment products according to the primary criteria. Consequently, it is anticipated that this system will deliver precise recommendations, facilitate decision-making for users, and enhance sharia financial literacy and inclusion in Indonesia. This study also enhances the literature on SAW-based SPK creation, particularly within the framework of sharia banking. This research comprises several key components. The initial section delineates the context and significance of the research, succeeded by a review of pertinent literature and the conceptual framework. The subsequent section delineates the research methodology, encompassing system design, data acquisition, and computational procedures employing the SAW approach. The third component examines the outcomes of system deployment and analysis, whereas the concluding section encapsulates the research findings and offers recommendations for subsequent research. This structure aims to offer realistic answers for the public in selecting sharia investment products and serve as a significant reference for advancing SPK in the sharia financial sector.

II. RELATED WORKS/LITERATURE REVIEW

The utilization of decision support systems (DSS) in diverse fields, such as finance, has been extensively examined to tackle the intricacies of decision-making processes. In the realm of Islamic banking, Decision Support Systems (DSS) have become an essential instrument for aiding users in the selection of financial products that conform to sharia principles. Numerous research have utilized several methodologies to build and execute Decision Support Systems, each providing distinct insights and constraints. The methods used for research on Decision Support Systems (DSS) in the field of Sharia Banking include AHP, Simple Additive Weighting (SAW) [11], Elimination Et Choix Traduisant La Realite (Electre) [12], Wighted Product (WP) [13] and Simple Multi Attribute Rating Technique (SMART)[14].

Ikhsan conducted research to establish a decision support system (DSS) utilizing the Simple Multi Attribute Rating Technique (SMART) method for recommending investment instruments. SMART was selected because to its flexibility, comprehensibility, and capability to accommodate weighted factors, including beginning capital, time frame, risk, rewards, and experience[14]. Another research from Fatchan where DSS assists beginner investors in selecting appropriate investment instruments. Investment in stocks is gaining popularity among the younger demographic; yet, insufficient financial literacy frequently results in losses for inexperienced investors. This study use the Simple Additive Weighting (SAW) method to offer suggestions for high-performing equities. The outcome is a decision assistance system that evaluates and ranks 70 JII70 index equities, assisting investors in selecting the optimal stocks.[11]. This decision support system helps investors select the best financial sector stocks based on healthy fundamentals. Using the Weighted Product method, it analyzes financial ratios like NPM, ROE, EPS, PER, DER, and PBV from 2021 banking data. The system ranks stocks, aiding investors in minimizing losses and making informed choices[13]. Following the COVID-19 pandemic, stock investment has gained popularity; yet, several investors lack comprehension of critical measures such as Dividend Yield, EPS, and ROE. Selecting stocks is challenging as every facet must be evaluated. This study employs the ELECTRE approach to develop a decision support system that utilizes ranking criteria, assisting investors in selecting optimal equities by evaluating pertinent alternatives. This approach is intended to facilitate better informed stock investment selections [12].

Moreover, research on financial literacy within Islamic banking underscores the significance of tools like Decision Support Systems (DSS). The National Financial Literacy Survey (2023)[6] indicates that most individuals possess inadequate understanding of Islamic financial products. And no one has discussed the selection of investment products. This gap highlights the necessity for technology that aids decision-making and informs users about investment products in Islamic banking. In conclusion, while other methodologies such as AHP, WP, Electre, Smart, and SAW have been explored in DSS creation, SAW is distinguished as a practical

method owing to its simplicity and effectiveness in assessing alternatives based on diverse criteria. Nonetheless, the application of SAW for the selection of financial items in Islamic banking remains an uncharted territory. This work fills these gaps, enhancing both the academic literature and practical advancements in decision support systems for Islamic banking. Future study ought to explore the integration of real-time analysis with user-centered design to enhance the usability and effectiveness of Decision Support Systems in this domain.

III. METHODS

This research has provided an overview of investment selection in sharia banking. Where some weighting and ranking of criteria can be done using several methodologies such as AHP, SAW, WP, SMART, ELECTRE and other similar approaches. This study makes a significant contribution by including investment selection standards for determining weights. To make subsequent measurements easier, use various SAW methods. The weighting characteristics of the model are shown in Figure 2.

A. Simple Additive Weighting (SAW) method

The Simple Additive Weighting (SAW) method requires the normalization of the decision matrix (X) to establish a uniform scale for comparing different ratings. The SAW (Simple Additive Weighting) method recognizes two unique attributes: the benefit criteria and the cost criteria. The primary difference between these two criteria is in the method of criterion selection during the decision-making process. [15]

The solution phase for the Simple Additive Weight (SAW) methodology is outlined as follows [16]:

1) Identify the evaluative criteria, referred to as Ci, that will underpin the decision-making process.
2) Evaluate the suitability rating of each option according to each criterion.
3) Develop a decision matrix utilizing the designated criteria (Ci), thereafter normalizing the matrix by an equation modified to reflect the attribute type (benefit or cost), so obtaining a normalized matrix referred to as R.
4) The final result is obtained through ranking, in which the normalized matrix R is multiplied by the weight vector. The resultant values are subsequently assessed, and the alternative (Ai) with the highest value is selected as the best option.

$$rij = \frac{xij}{\max(xij)} \text{ j is benefit attribute} \quad (1)$$

$$rij = \frac{\min(xij)}{xij} \text{j is cost attribute} \quad (2)$$

a) The variable "rij" gives the score for the normalized performance rating.
b) The variable xij denotes the attribute value for each criterion.
c) The variable Max xij denotes the maximum value for each condition.
d) The variable min xij indicates the minimum value for each condition.
e) The concept of benefit depends on the idea that the greatest value is the most advantageous.
f) Cost is optimized when the minimum value is chosen.
g) The variable rij indicates the performance of a twig, with i varying from 1 to m and j varying from 1 to m. The alternate preference value (vi) can be defined as:

$$v_i = \sum_j^n = 1^{wjrij} \quad (3)$$

h) The variable v_i indicates the ranking for the specified choice.
i) The variable w_j defines a particular value utilized as an evaluative criterion. Weight can be expressed by the normalized performance rating score, indicated as r_ij.
A high V value indicates a preference for option A.

B. Characteristic Investment

The criteria are taken from several studies whose results show the greatest value that is taken into consideration in determining investment products.

1. Interest Rate Factor is a component used in financial calculations to represent the impact of interest rates on investments, loans, or other financial instruments. It is typically expressed as a percentage and reflects the cost of borrowing or the return on savings and investments over a given period [17].
2. The Rate of Return on Investment (ROI) is a financial statistic utilized to assess the profitability or effectiveness of an investment. It quantifies the percentage increase or decrease of an investment in relation to its original cost over a defined timeframe [18].
3. Investment risk refers to the possibility of losing some or all of the original investment or not achieving the expected return. It represents the uncertainty and potential for financial loss inherent in any investment decision [19].

4. Investment security refers to a financial asset or instrument that is purchased with the intention of generating income, preserving capital, or achieving capital appreciation over time. These securities are typically traded on financial markets and represent ownership, debt, or other rights to assets [20].
5. Investment Period is denoting the duration an investor intends to retain an investment prior to liquidating assets or realizing profits. The duration during which capital is allocated to financial instruments or assets to attain defined financial objectives[21].

C. Alternative Investment Product in sharia banking

Alternative investment products in Sharia banking denote investment possibilities that adhere to Islamic law (Sharia) and serve as substitutes for traditional financial goods. These investments adhere to principles that prohibit interest (riba) and prioritize profit-sharing and asset ownership. Below are principal categories of alternative investment products often available in Sharia banking.

1. Sharia Stock Investment are a form of investment that is safe for the community [24].
2. Sharia Mutual Fund Investment are fundraising initiatives from investors, managed by investment managers adhering to Sharia principles, namely by refraining from participating in enterprises whose business types and scopes contravene Islamic law [25].
3. Sukuk Investment were utilized in medieval Islam as money instruments for commerce and many purposes. In contemporary terms, sukuk is widely recognized as a Sharia-compliant financial instrument that grants its holders ownership rights to certain assets, associated value, and investment ownership in projects[26].
4. Sharia Deposits is the notion of Islamic banks, which should be aligned with rahmatan lil alamin, must indeed be inclusive of all humanity, encompassing non-Muslims as well. The consumers' apprehension over sharia bank deposit products stems from a sense of "unrepresentation" or the misalignment of Islamic banking with the preferences of non-Muslim clients to negotiate profit agreements within this framework. This is demonstrated by Islamic banking products, including sharia deposits that exclusively utilize mudharabah contracts[27].
5. Sharia Property Investment is a people, especially muslims, feel much more at ease because they can avoid usury, which is forbidden in Islam, thanks to sharia property, which has become a popular option for the community, particularly for those looking to invest or purchase a home. Sharia property investment refers to property investment conducted in accordance with religious principles, ensuring that all actions, including the acquisition of a house for investment purposes, are compliant with these guidelines[28].
6. Sharia Gold Investment is a fundamental long-term strategy for many individuals to diversify their financial portfolios. Muslims consistently seek halal products and services in several facets of life, including Shariah-compliant gold investments (SGI)[29].

D. Research Steps

Research steps is stage or phase in the systematic process of conducting research. Each step is a distinct action or milestone aimed at contributing to the overall research objectives. The steps collectively guide researchers in defining problems, collecting data, analyzing findings, and drawing conclusions in a structured and methodical way. Is show Fig 2.

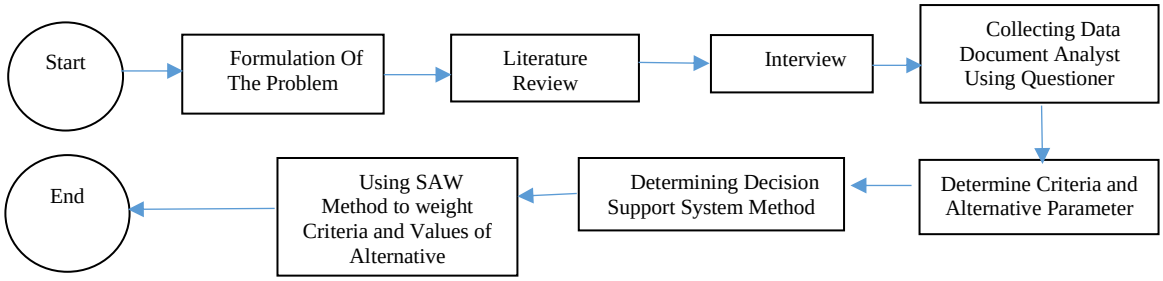

Fig. 1 Research Steps

1. Start : The research process commences with the identification of the primary study objective, namely addressing a particular problem through a defined methodology.
2. Formulation of the Problem : This phase entails delineating the issue to be addressed in the research. The researcher delineates the parameters, extent, and primary aims of the issue to establish the foundation of the study. At this juncture, it is crucial to record particular research inquiries or aims.
3. Literature Review : Perform a literature review by examining and evaluating pertinent prior research. The objective is to comprehend the foundational idea, explore employed methodologies, and pinpoint

research deficiencies. A literature review aids in the development of the theoretical framework and pertinent methodologies.

4. The interview phase : entails collecting information from sources with relevant experience or expertise concerning the researched issue. Interviews were performed to gather comprehensive qualitative data concerning the research subject.
5. Collecting Data Document Analyst Using Questionnaire: Data collection was conducted through a questionnaire to get information from respondents. This phase seeks to gather both quantitative and qualitative data for subsequent analysis.
6. Determine Criteria and Alternative Parameters: Identify pertinent evaluation criteria and alternative parameters related to the issue being examined. These criteria are employed to assess diverse possibilities or alternative solutions.
7. Determining Decision Support System Method: Select a decision support system (DSS) methodology for problem analysis and resolution. The selected approach must align with research requirements, such as the SAW (Simple Additive Weighting) method.
8. Using SAW Method to Weight Criteria and Values of Alternative: Implementation of the SAW method to provide weights to the criteria and assess the worth of each alternative according to these weights. This procedure entails data normalization and score computation to identify the optimal alternative.
9. End: The research is finalized at the completion of all aforementioned steps. The ultimate outcome consists of recommendations, reports, or conclusions derived from the conducted analysis.

IV. RESULTS

At the results stage, an overview will be given in choosing the type of sharia banking investment product based on the criteria of investment characteristics. To get recommendations for investment options, we will use the SAW methodology. This study makes a significant contribution by including investment criteria for determining weights. And provide value to each alternative choice of sharia banking products.

A. Model Weighting Characteristic Investment using SAW method

This work significantly contributes by incorporating investment criteria types in Shariah banking standards for weight assignment. To enable more measurements with various Simple Additive Weighting techniques.

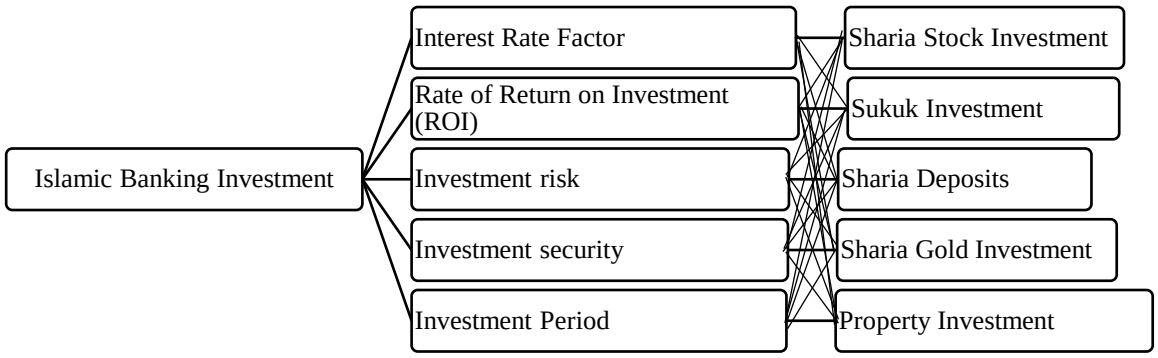

Fig 2. Islamic Banking Investment Model

The primary purpose is to ascertain the structure of Islamic Banking Investment from Fig 2. The factors evaluated encompass Interest Rate Factor, Rate of Return on Investment (ROI), Investment Risk, Investment Security, and Investment Duration. The examined investment possibilities, based on these criteria, comprise Sharia Stock Investment, Sukuk Investment, Sharia Deposits, Sharia Gold Investment, and Property Investment. This approach delineates the correlation between criteria and options to facilitate investing decisions grounded in sharia principles.

B. Weighting Process With SAW

In this study, the expert will complete a questionnaire to ascertain the significance of the criteria employed by the SAW method. For criteria is show in TABLE 1.

TABLE 1
RESULT CRITERIA WEIGHTING

Criteria Code	Criteria Name	Criteria Weight	Type
C1	Interest Rate	30	Benefit
C2	Rate of Return on Investment (ROI)	10	Benefit
C3	Investment risk	25	Cost
C4	Investment security	20	Benefit
C5	Investment Period	15	Cost
	Total	**100**	

The criteria weighting process employs the Simple Additive Weighting (SAW) method to establish investment priorities in sharia banking. The "Result Criteria Weighting" table delineates five primary criteria: Interest Rate (C1) assigned a weight of 30 (Benefit), Rate of Return on Investment (ROI) (C2) with a weight of 10 (Benefit), Investment Risk (C3) weighted at 25 (Cost), Investment Security (C4) also at 20 (Benefit), and Investment Period (C5) with a weight of 15 (Cost). The cumulative weight of the criteria is 100, and the allocation between the "Benefit" and "Cost" categories is employed to ascertain the ideal value of the investment alternative. The weighting is determined by the significance level derived from a questionnaire administered to experts.

This research uses the Simple Additive Weighting (SAW) method to determine the Priority of Investment after determining the weight of the criteria.

C. Alternative Assessment Sharia Banking Investment Products with SAW

Evaluation of alternative Sharia banking investment products utilizing the Simple Additive Weighting (SAW) approach. TABLE 2 presents a compilation of investment choices, with their respective codes and designations: A1: Sharia Stock Investment, A2: Sukuk Investment, A3: Sharia Deposits, A4: Sharia Gold Investment, and A5: Property Investment. TABLE 3 presents the assessment weight values utilized in this methodology, employing a quality scale: Very Good (5), Good (4), Satisfactory (3), Poor (2), and Very Poor (1). This information aids the evaluation process to identify the optimal investment option based on established criteria.

TABLE 2
ALTERNATIVE INVESTMENT

Alternative Code	Alternative Name
A1	Sharia Stock Investment
A2	Sukuk Investment
A3	Sharia Deposits
A4	Sharia Gold Investment
A5	Property Investment

TABLE 3
WEIGHT VALUE

Weight	Score
Very Good	5
Good	4
Good Enough	3
Not Good	2
Very Bad	1

TABLE 4
ALTERNATIVE VALUE

Alternative	Criteria				
	C01	**C02**	**C03**	**C04**	**C05**
	Benefit	Benefit	Cost	Benefit	Cost
Sharia Stock Investment	2	5	5	3	4
Sukuk Investment	1	3	2	5	3
Sharia Deposits	5	2	1	5	2
Sharia Gold Investment	4	4	3	4	4
Property Investment	3	4	4	4	5
Total	**1,000**	**1,000**	**1,000**	**1,000**	**1,000**

Alternative values of five categories of Sharia banking investments based on five criteria (C01 to C05) is show in TABLE 4. Each criterion is associated with a form of assessment, either Benefit or Cost. Evaluated alternatives comprise Sharia Stock Investment, Sukuk Investment, Sharia Deposits, Sharia Gold Investment, and Property Investment. Each criterion is assigned a value on a scale of 1 to 5, culminating in a total normalized value of 1,000 per criterion. This evaluation will be utilized to establish investment priorities employing pertinent methodologies, such as SAW (Simple Additive Weighting).

The next stage entails determining the value allocated to the decision maker's preference, represented as W = (5, 4, 3, 2, 1), followed by the calculation of the normalization matrix using the specified formula is show in TABLE 5. After normalization for the result is shown in TABLE 6 and TABLE 7. For result can see from Fig. 3

Based on table 8. is converted into X decision matrix with data:

$$X=\begin{bmatrix} 2 & 5 & 5 & 3 & 4 \\ 1 & 3 & 2 & 5 & 3 \\ 5 & 2 & 1 & 5 & 2 \\ 4 & 4 & 3 & 4 & 4 \\ 3 & 4 & 4 & 4 & 5 \end{bmatrix}$$

The computation of the aforementioned equation is shown below:

$$rij = \frac{xij}{\max(xij)} \text{j is benefit attribute} \quad (4)$$

$$rij = \frac{\min(xij)}{xij} \text{j is cost attribute} \quad (5)$$

Normalization:

TABLE 5
NORMALIZATION VALUE

Alternative	**Criteria**				
	C01	**C02**	**C03**	**C04**	**C05**
	Benefit	Benefit	Cost	Benefit	Cost
Sharia Stock Investment	2/5	5/5	1/5	3/5	2/4
Sukuk Investment	1/5	3/5	1/2	5/5	2/3
Sharia Deposits	5/5	2/5	1/1	5/5	2/2
Sharia Gold Investment	4/5	4/5	1/3	4/5	2/4
Property Investment	3/5	4/5	1/4	4/5	2/5

TABLE 6
RESULT NORMALIZATION VALUE

Alternative	**Criteria**				
	C01	**C02**	**C03**	**C04**	**C05**
	Benefit	Benefit	Cost	Benefit	Cost
Sharia Stock Investment	0,4	1	0,2	0,6	0,5
Sukuk Investment	0,2	0,6	0,5	1	0,6
Sharia Deposits	1	0.4	1	1	1
Sharia Gold Investment	0,8	0,8	0,3	0,8	0,5
Property Investment	0,6	0,8	0,25	0,8	0,4

$$v_i = \sum_j^n = 1^{wjrij} \quad (6)$$

TABLE 7
RESULT RANK SHARIA BANKING INVESTMENT PRODUCTS

Alternative	**Result**	**Rank**	
Sharia Stock Investment	(0,3*0,4)+(0,1*1)+(0,25*0,2)+(0,2*0,6)+(0,15*0,5)	0,465	5
Sukuk Investment	(0,3*0,2)+(0,1*0,6)+(0,25*0,5)+(0,2*1)+(0,15*0,6)	0,535	4
Sharia Deposits	(0,3*1)+(0,1*0,4)+(0,25*1)+(0,2*1)+(0,15*1)	0,94	1
Sharia Gold Investment	(0,3*0,8)+(0,1*0,8)+(0,25*0,3)+(0,2*0,8)+(0,15*0,5)	0,63	2
Property Investment	(0,3*0,6)+(0,1*0,8)+(0,25*0,25)+(0,2*0,8)+(0,15*0,4)	0,5425	3

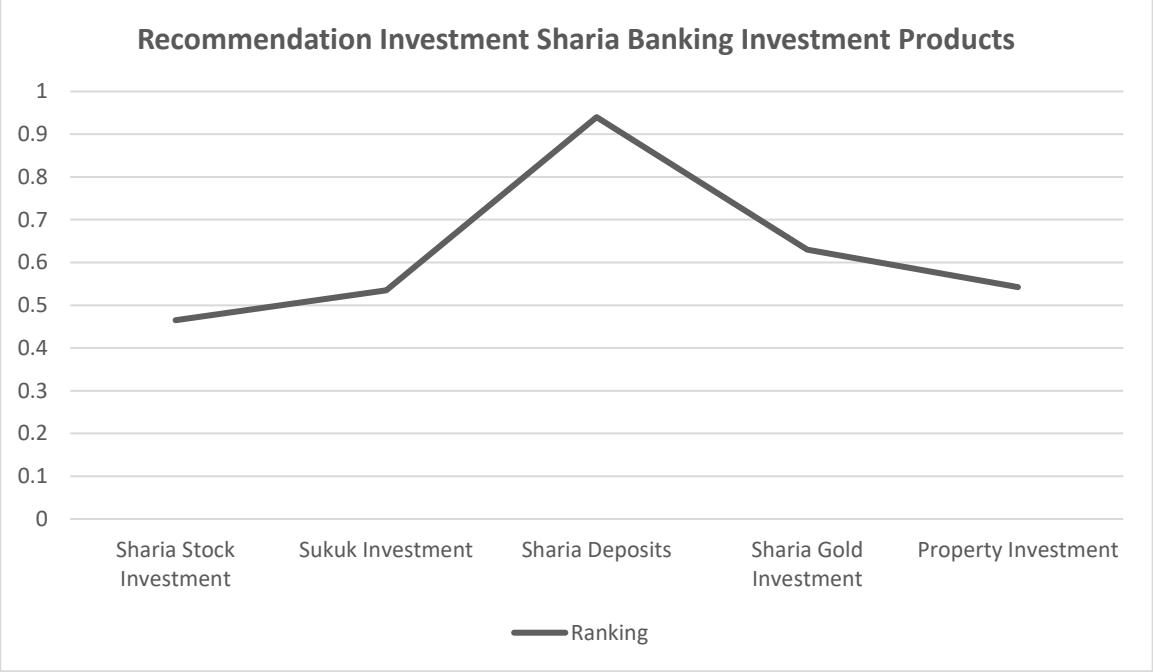

Fig. 3 Recommendation Investment Sharia Banking Investment Products

V. DISCUSSION

This study's results show the efficacy of the Simple Additive Weighting (SAW) method in fulfilling the essential requirement for a systematic and accessible approach to selecting sharia-compliant investment goods. The DSS offered clear and accurate recommendations adapted to individual investor needs by assessing five essential criteria: Interest Rate, Rate of Return on Investment (ROI), Investment Risk, Investment Security, and Investment Period. The normalization and weighing techniques highlighted both benefit and cost factors, ensuring a comprehensive evaluation of alternatives. In contrast to previous methodologies like SMART, AHP, and ELECTRE employed in analogous circumstances, the SAW method demonstrated superiority owing to its simplicity and computing efficiency. This corresponds with prior research that recognized SAW as exceptionally successful in multi-criteria decision-making contexts. The system's capacity to evaluate options, including Sharia Deposits and Sharia Gold Investments, underscored its practical applicability, corresponding with the increasing demand for sharia-compliant financial instruments in Indonesia.

A notable discovery is the elevated ranking of Sharia Deposits, which attained a normalized score of 0.94, establishing it as the most advantageous investment alternative based on the specified criteria. This discovery highlights the capability of these products to achieve both financial rewards and compliance with Islamic standards. Simultaneously, options such as Sharia Gold and Property Investments had moderate scores, indicating varied investment choices based on personal preferences and risk tolerance. The implications of these findings are significant, especially in Indonesia, where financial literacy about Islamic assets is deficient. The DSS offers a structured framework that connects technical investment knowledge with practical decision-making. Furthermore, the study enhances financial inclusion by facilitating better informed decisions among prospective investors.

The study identified limits in static criterion evaluations, emphasizing the necessity for future revisions of the DSS to incorporate real-time market data and predictive analytics. Integrating user feedback techniques could significantly improve the system's adaptability and user experience. Moreover, broadening the scope to encompass additional Islamic financial products may enhance the DSS's applicability across diverse demographic and economic settings. This study confirms the effectiveness of SAW as a fundamental approach for constructing decision support systems in sharia banking. The approach enhances informed decision-making, so fostering individual financial well-being and furthering the overarching objective of financial literacy and inclusivity in the Islamic banking industry.

VI. CONCLUSIONS

This study effectively illustrates the utilization of the Simple Additive Weighting (SAW) approach in creating a Decision Support System (DSS) to facilitate the selection of sharia-compliant banking investment products. Through the assessment of essential parameters including Interest Rate, Rate of Return on Investment (ROI), Investment Risk, Investment Security, and Investment Duration, the system delivered accurate and pragmatic suggestions, with Sharia Deposits identified as the optimal choice. This result underscores the significance of

systematic techniques such as SAW in improving decision-making processes and mitigating the deficiency of financial literacy in Islamic banking investments.

The research substantially enhances financial inclusion and literacy by connecting intricate financial data with accessible decision-making tools. Nevertheless, the study recognizes several limitations, notably the fixed nature of criteria and the lack of connection with real-time market data. Addressing these concerns in subsequent study could improve the system's adaptability and precision. Moreover, extending the system's application to additional financial products could enhance its significance and influence.

This research has practical applications in enabling individual investors to make educated decisions and fostering the adoption of sharia-compliant financial products in areas with low financial literacy. Further study should incorporate predictive analytics, advances in user-centered design, and the inclusion of other criteria such as environmental and social governance (ESG) concerns, aligning with the ethical principles of Islamic banking. This study highlights the potential of technology-driven solutions in furthering the objectives of sharia-compliant financial systems.

REFERENCES

[1] M. A. Ledhem, "The financial stability of Islamic banks and sukuk market development: Is the effect complementary or competitive?," *Borsa Istanbul Rev.*, vol. 22, pp. S79–S91, 2022, doi: 10.1016/j.bir.2022.09.009.

[2] F. Fitriyanti, M. F. Akbar, A. P. Syamsu, and R. F. Nurhaifa, "Application of Sharia Principles in Sharia Financial Institutions," *Fiat Justisia J. Ilmu Huk.*, vol. 17, no. 2, pp. 157–166, 2023, doi: 10.25041/fiatjustisia.v17no2.2849.

[3] Global Islamic Liquidity Management Report, "Building a Robust and Resilient Ecosystem Global Islamic Liquidity Management Report 2023," 2023.

[4] M. F. Hadziq, Y. Mardoni, I. Solihat, and M. Rahmanto, "Analysis of the Effect Spin-Off Increasing Shariah Compliance in Indonesian Islamic Bank," *Proceeding Int. Semin. Business, Econ. Soc. Sci. Technol.*, vol. 3, no. 1, pp. 184–190, 2023, doi: 10.33830/isbest.v3i1.1489.

[5] U. Islam, N. Sunan, and U. I. Indonesia, "Sharia investment Challenges and Growth for Sustainable and Inclusive Financial Equality in Digital Innovation Mohammed Kenneh," vol. 3, no. 1, pp. 1–11, 2024.

[6] I. Amalia and A. Widyasanti, "PRESS RELEASE OJK AND STATISTICS INDONESIA PRESENT NATIONAL SURVEY ON FINANCIAL LITERACY AND INCLUSION 2024 FINDINGS," *OJK*, pp. 75–77, 2024.

[7] I. R. Purbaningrum, N. Luthfia, and A. Nasim, "The Problems of Sharia Investment in Indonesia from The Perspective of Maqashid Al-Sharia," *Islam. Res.*, vol. 7, no. 2, pp. 229–236, 2024, doi: 10.47076/jkpis.v7i2.306.

[8] S. ul Rehman, I. Wani, M. Khanam, and Y. S. A. Almonifi, "A Brief Review of Growth and Development in Islamic Banking," *SSRN Electron. J.*, no. June, 2021, doi: 10.2139/ssrn.3867044.

[9] B. Khalidin, A. Musa, and A. Kiawan, "Murabaha Financing of the Indonesian Islamic Banks Under an Islamic Economic Law and the Fatwa Dsn Mui," *Petita J. Kaji. Ilmu Huk. dan Syariah*, vol. 8, no. 2, pp. 203–218, 2023, doi: 10.22373/petita.v8i2.238.

[10] I. F. S. Board, *Islamic Financial Services Industry Stability report 2024*. 2024.

[11] M.Fatchan, R. Pangestsu, and A. Firmansyah, "Sistem Pendukung Keputusan Pemilihan Saham Terbaik Untuk Portofolio Investasi Syariah Menggunakan Metode SAW," *J. Ilm. Intech Inf. Technol. J. UMUS*, vol. 4, no. 1, pp. 141–152, 2022.

[12] Yulhendri and S. V. Dero, "Sistem Pendukung Keputusan Pemilihan Saham Dengan Metode Electre," *J. Sist. Informasi, Akuntansi, dan Manaj.*, vol. 2, no. 3, pp. 324–336, 2022.

[13] M. Irfan, Yanuardi, and N. Yudaningsih, "Implementasi Metode Weighted Product Pada Sistem Pendukung Keputusan Pemilihan Lembaga Bimbingan Belajar," *Bull. Comput. Sci. Res.*, vol. 3, no. 1, pp. 37–44, 2022, doi: 10.47065/bulletincsr.v3i1.195.

[14] I. Andriyawan, D. Asmajarati, and A. Suwondo, "Sistem Pendukung Keputusan Pemilihan Instrumen Investasi Menggunakan Metode Simple Multi Attribute Rating Technique (Smart)," *Biner J. Ilm. Inform. dan Komput.*, vol. 2, no. 1, pp. 65–75, 2023, doi: 10.32699/biner.v2i1.4238.

[15] D. Pribadi, R. A. Saputra, J. M. Hudin, and Gunawan, *Sistem Pendukung Keputusan*. 2018.

[16] G.-H. T. J.-J. Huang, *Multiple Attribute Decision Making Methods and Application*. 2011.

[17] N. Rosanti, "Faktor yang Mempengaruhi Nasabah Memilih Tabungan Rencana di Makassar," *J. Manaj. Perbank. Keuang. Nitro*, vol. 2, no. 1, pp. 9–14, 2019, doi: 10.56858/jmpkn.v2i1.13.

[18] F. Fitriaty, M. H. Saputra, and D. Elliyana, "Analisis Faktor – Faktor Yang Mempengaruhi Keputusan Investasi Selama Covid-19 Di Bursa Efek Indonesia," *J. Manaj. Terap. dan Keuang.*, vol. 11, no. 2, pp. 324–334, 2022, doi: 10.22437/jmk.v11i2.18604.

[19] R. Lisdayanti and L. Hakim, "Pengaruh pengetahuan investasi syariah produk investasi syariah dan modal minimal mahasiswa terhadap minat investasi Bank Syariah dengan risiko investasi sebagai variabel

intervening pada mahasiswa Perguruan Tinggi Negeri Kota Surabaya," *J. Masharif al-Syariah J. Ekon. dan Perbank. Syariah*, vol. 6, no. 1, pp. 13–28, 2021, [Online]. Available: http://journal.um-surabaya.ac.id/index.php/Mas/index

[20] N. J. Haritz Harahap, Atika, "FAKTOR-FAKTOR YANG MEMPENGARUHI GAYA HIDUP SYARIAH, TINGKAT BONUS, BEBAS BIAYA ADMINISTRASI DAN TINGKAT KEAMANAN TERHADAP KEPUTUSAN NASABAH MEMILIH PRODUK TABUNGAN EASY WADIAH (STUDI KASUS BANK SYARIAH INDONESIA KC MEDAN GAJAH MADA)," vol. 07, no. 02, pp. 1–14, 2023.

[21] Sune Ferreira-Schenk and Z. Dickason-Koekemoer, "Analysing the Factors Affecting the Long-term Investment Intention of Investors," *Int. J. Econ. Financ. Issues*, vol. 13, no. 1, pp. 112–120, 2023, doi: 10.32479/ijefi.13640.

[22] M. Hasan, M. I. Ahmad, M. Y. Rafiq, and R. U. Rehman, "Dividend Payout Ratio and Firm's Profitability. Evidence from Pakistan," *Theor. Econ. Lett.*, vol. 05, no. 03, pp. 441–445, 2015, doi: 10.4236/tel.2015.53051.

[23] D. Agestia and Khairunnisia, "Pengaruh firm size, price earning ratio, dan book to market ratio terhadap return saham," *J. Akunt.*, vol. 6, no. 2, pp. 215–226, 2013.

[24] B. Heradhyaksa and U. Baroroh, "Sharia Stock Investment as a Strategy for Strengthening the Economy of the Riau Border Region," in *Proceedings of the International Seminar on Border Region (INTSOB 2023*, Atlantis Press SARL, 2024, pp. 21–27. doi: 10.2991/978-2-38476-208-8_5.

[25] A. Maftukhah, "The Performance of Sharia Equity Fund Investment Manager," *J. Iqtisaduna*, vol. 1, no. 1, p. 81, 2020, doi: 10.24252/iqtisaduna.v1i1.16056.

[26] A. Alam, R. T. Ratnasari, W. Sawinda, and M. H. Al Hakim, "How does Sukuk Investment Perform? A Literature Review," *Int. J. Prof. Bus. Rev.*, vol. 8, no. 7, p. e02580, 2023, doi: 10.26668/businessreview/2023.v8i7.2580.

[27] M. F. Fahmi, B. Mutafarida, and A. H. Fajrin, "The Concept of Profit Sharing on Deposits Sharia in Islamic Bank for Non-Muslim Market," *J. Masharif al-Syariah J. Ekon. dan Perbank. Syariah*, vol. 7, no. 4, pp. 1562–1577, 2022, [Online]. Available: https://journal.um-surabaya.ac.id/index.php/Mas/article/view/18036

[28] D. Pratiwi, S. D. Sabbar, K. N. Salam, U. Islam, N. Alauddin, and U. Hasanuddin, "Application of the Basic Concept of Islamic Economics To the Effectiveness of Sharia," *Researchgate.Net*, vol. 2, no. November, pp. 731–746, 2022, [Online]. Available: https://www.researchgate.net/profile/Dhita-Pratiwi-Ar/publication/370737177_APPLICATION_OF_THE_BASIC_CONCEPT_OF_ISLAMIC_ECONOMICS_TO_THE_EFFECTIVENESS_OF_SHARIA_PROPERTY_COMPANIES/links/645f8c41fbaf5b27a4c4e441/APPLICATION-OF-THE-BASIC-CONCEPT-OF-ISLAMIC-

[29] H. A. Juisin, M. A. S. Mohd Sayuthi, H. Amin, and I. M. Shaikh, "Determinants of Shari'ah gold investment behaviour: the case of Penang, Malaysia," *J. Islam. Mark.*, vol. 14, no. 12, pp. 3228–3246, 2023, doi: 10.1108/JIMA-11-2021-0360.