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Decision Support System for Selection of Productive at Sahabat Sampulo Foundation Using the Profile Matching Method

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ABSTRACT

The Sahabat Sampulo Foundation is dedicated to supporting and empowering underprivileged individuals by providing them with opportunities to engage in productive activities. However, the process of selecting the most suitable individuals for various productive projects can be challenging due to the large number of applicants and the diverse range of skills required. To address this issue, a Decision Support System (DSS) utilizing the Profile Matching Method is proposed. Making decisions is one of the most basic things in everyday life, in the decision-making process humans are often faced with many alternatives to choose from, so that in a problem, several decision makers can make different decisions. The advancement of this technology has also been put to good use by the Sahabat Sampulo Foundation to determine the selection of productive and unproductive employees. Because it still uses traditional methods subjectively and manually, from these problems a system is needed that can help determine employee data decisions for the Sahabat Sampulo Foundation. This Profile Matching method compares the value and actual data of a profile that will be assessed with the profile value that is applied.

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1. INTRODUCTION

The discipline of human resources or employees is one of the many factors that can affect the performance of a company or foundation. Human resource discipline is formed by recording experiences and lessons from various repeated deficiencies in the process of training employee discipline [1].

At the moment, the Sahabat Sampulo Foundation has various problems experienced by several companies and the Sahabat Sampulo Foundation in determining the best employees, the determination is made not only by direct appointment by management and not by means of subjective assessment, but a company must evaluate employee performance in certain period [2].

In addition, the condition that is a problem at the Sahabat Sampulo Foundation in determining the best employee lies in the evaluation process which is still carried out manually. According to [3]. This makes it difficult for companies to determine the eligibility of the best employee [3]. Furthermore, the problem of subjectivity in the selection of productive and unproductive employees is an almost unavoidable problem. Management and employees need a performance appraisal process that is accurate and fast and can provide direct feedback and improvements in the work environment [4]. One of the factors that need serious attention for managers of a company or agency is decision making. To make a decision, careful analysis and calculations are needed, depending on the number of criteria that affect the problems that require a decision to be interrelated [5].

Along with the times, system development efforts have increased in terms of complexity and integration. The system can not only save 10%–20% of the project budget, but also prevent half of all failures [6]. In assessing human resources or employees, companies are starting to follow Information Technology (IT) such as Decision Support Systems (SPK) with the aim that the assessment carried out by the company will suit the company's needs [7].

To overcome some of the problems that have been described by researchers, this study aims to use a Decision Support System (DSS) with the Profile Matching method. The use of this method aims to make it easier for the Sampulo Friends Foundation (YSS) to select productive and unproductive employees.

The reason for using the Profile Matching method is because Profile Matching is an appropriate method for making decisions that is closely related to the value of job performance and competence because the calculations are carried out by weighting and calculating competency gaps [9]. Researchers chose the Profile Matching method compared to other methods in decision support systems because the Profile Matching method considers logical consistency in the assessment used to determine priorities so as to produce alternatives that are not many at the same time have a short time and have better accuracy compared to other methods [9].

2. METHODS

This chapter explains the approach and steps used in the research to develop a Decision Support System for the Selection of Productive Individuals at Sahabat Sampulo Foundation using the Profile Matching method. This section consists of the following sub-sections: types and research location, research approach, data sources, data collection method, data processing and analysis methods, system testing techniques, and system development method.

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2.1. Types and Research Locations

This research was conducted using this type of research. This research implemented a solution to the problem of selecting employees with a decision support system, namely using the Profile Matching Method. This research was conducted at the Sampulo Friends Foundation (YSS) which is located at Jl. Sultan Dg. No. 4 Malimongan Baru, Bontoala District, Makassar City, South Sulawesi.

2.2. Research Approach

This study employed a comprehensive research approach by combining quantitative and qualitative methodologies. The quantitative approach involved collecting and analyzing numerical data to examine the impact of decision support system variables on identifying productive and unproductive employees at the Sahabat Sampulo Foundation (YSS) using the Profile Matching method. The qualitative approach involved gathering and analyzing non-numerical data, such as interviews and observations, to gain deeper insights into contextual factors and individual perspectives. By utilizing both approaches, this study aimed to provide a holistic understanding of the relationship between decision support system variables and employee productivity at YSS.

2.3. Data Source

The source of the data in this study is using library research which is a way of collecting data from several books, journals, theses, which are related to the intent of the management information system which can be used as a reference for discussing this issue. Linkage to online or internet data sources as well as results from previous research as reference material for future researchers.

2.4. Method of Collecting Data

1) Interview: The interview process was conducted to obtain information in the form of: conducting interviews with the managers of the Sahabat Sampulo Foundation to obtain employee information.
2) Literature Study: In this study, the literature study was conducted by collecting data sourced from reference books, journals, papers, and theses related to information systems and website decision support systems.
3) Observation: Make direct observations of the object of research to the employees of the Sahabat Sampulo Foundation.

2.5. Data Processing and Analysis Methods

1) Data Processing: Data processing in question is by assigning an identity code and presenting in a tabulation table each data to be analyzed such as processing report data, report formats and efficiency and effectiveness data obtained from user observations in using the application.
2) Data Analysis: The analysis used is the analysis of quantitative and qualitative approaches, where the quantitative approach emphasizes testing theory through measuring variables using statistical procedures.

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2.6. System Testing Techniques

In this study, the researchers have adopted a rigorous testing approach to evaluate the functionality and performance of each released feature. Specifically, they employed black box testing techniques to systematically assess the system's behavior and ensure its adherence to the specified requirements. Through black box testing, the researchers aimed to uncover any potential issues or bugs that may arise during user interaction with the system. The testing process involved simulating various scenarios and inputs to validate the expected outputs and identify any discrepancies or anomalies.

Furthermore, to evaluate the effectiveness and efficiency of the system, the researchers conducted detailed observations on the tasks assigned to the users. These observations aimed to gauge the user's ability to successfully perform the assigned tasks using the system's features. Additionally, the researchers recorded the time taken by the users to complete each given task, providing insights into the system's efficiency in supporting task completion. By closely observing user interactions and task performances, the researchers could identify any usability challenges, bottlenecks, or areas where further improvement was required.

The combination of black box testing and task observations allowed the researchers to gather comprehensive data on the system's performance, usability, and overall effectiveness. This data-driven approach provided valuable insights into the system's functionality, user experience, and potential areas for enhancement. Ultimately, by meticulously testing and observing the system's features, this study aimed to ensure the reliability and usability of the developed system, contributing to its successful implementation and user satisfaction.

2.7. System Development Method

In In this study, the researcher opted to utilize the Waterfall methodology as the system development method. The Waterfall model is a widely recognized and established approach that follows a sequential development process. It is characterized by distinct phases that are completed in a linear fashion, with each phase building upon the completion of the previous one.

The Waterfall model typically consists of several key stages, including requirements gathering, system design, implementation, testing, deployment, and maintenance. In the requirements gathering phase, the researcher carefully documented the system's functional and non-functional requirements, ensuring a clear understanding of the project's objectives and scope. Subsequently, the system design phase involved creating a comprehensive blueprint that outlined the system's architecture, components, and interrelationships.

Once the design phase was completed, the implementation stage commenced, where the researcher translated the system design into actual code and developed the necessary software components. Following the implementation, rigorous testing was conducted to validate the system's functionality, performance, and reliability. The testing phase involved various testing techniques, such as unit testing, integration testing, and system testing, to ensure the system met the predefined requirements.

Upon successful completion of testing, the system was ready for deployment. This phase involved the installation and configuration of the system in the intended environment, ensuring smooth integration and compatibility with existing infrastructure. Finally, the maintenance phase focused on ongoing support, bug fixing, and system updates to ensure the system's longevity and optimal performance.

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By adopting the Waterfall model in this study, the researcher aimed to establish a structured and systematic approach to system development. This methodology allowed for a clear progression through each stage, enabling comprehensive documentation, thorough testing, and effective project management. Additionally, the Waterfall model facilitated better control over project timelines, costs, and deliverables, contributing to the successful development and implementation of the proposed system.

3. RESULTS AND DISCUSSION

This chapter provides a comprehensive discussion on the findings and analysis derived from the successful implementation of the Decision Support System (DSS) for the Selection of Productive Individuals at Sahabat Sampulo Foundation, utilizing the Profile Matching method. It delves into various sub-sections that shed light on different aspects of the implementation process. Firstly, the waterfall approach is explored, which entails a systematic and phased progression through the project stages, ensuring a well-organized and structured development process. Next, the chapter delves into the system implementation phase, highlighting the intricate steps taken to integrate the DSS into the existing infrastructure of Sahabat Sampulo Foundation, resulting in a seamless and efficient operation. Subsequently, the blackbox testing is discussed, which involved meticulously examining the functionality of the system from an end-user perspective, ensuring that it met the desired requirements and delivered the intended outcomes. Furthermore, the chapter addresses the evaluation of the system's usability through the employment of the System Usability Scale (SUS), enabling a comprehensive assessment of the user experience and satisfaction levels. Lastly, the chapter delves into the Profile Matching testing, providing an in-depth analysis of this method's effectiveness in selecting productive individuals for Sahabat Sampulo Foundation, unveiling valuable insights into the decision-making process. By delving into these sub-sections, this chapter offers a comprehensive overview of the implementation process and sheds light on the effectiveness and performance of the DSS, thus providing valuable insights for future improvements and enhancements.

3.1. Waterfall

In the development process using the waterfall methodology, multiple stages were followed to ensure a systematic and sequential approach [11]. One of the key aspects of the waterfall methodology is the release management process, which involves dividing the development into distinct releases. Throughout the development process, two releases were carried out, each representing a milestone in the project. These releases included the implementation and deployment of a functioning system, as depicted in **Figure 1**. The first release focused on the initial development and testing of core functionalities, while the second release involved further refinements and enhancements based on feedback and requirements. Each release was carefully planned and executed, with thorough testing and quality assurance measures in place [12-15]. The waterfall approach ensured a step-by-step progression in the development process, allowing for systematic and manageable releases of the system, such as running system as seen in **Figure 1.**

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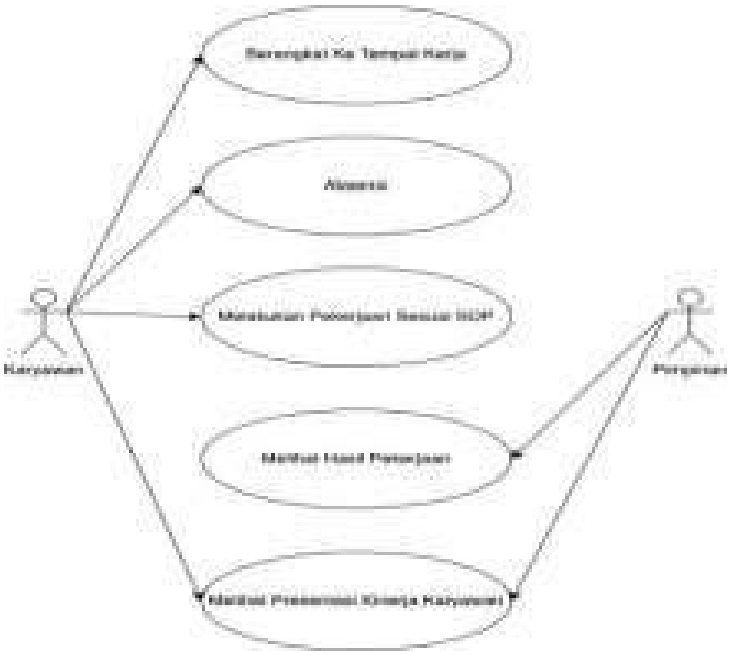

Figure 1. Running system analysis.

3.1. System Implementation

During the development process of this system, one of the crucial steps involved the creation of an intuitive and user-friendly interface. The interface design, depicted in **Figure 2 and Figure 3.**, was carefully crafted to ensure optimal usability and seamless interaction for users. Extensive attention was given to the visual elements, layout, and navigation of the interface to provide a smooth and efficient user experience. By incorporating user-centered design principles, such as clear labelling, intuitive icons, and logical information hierarchy, the interface aimed to enhance user engagement and facilitate effortless system exploration. Moreover, the interface design was informed by extensive user feedback and iterative testing, enabling the identification and resolution of any usability issues or challenges. Overall, the meticulous development of the interface played a pivotal role in ensuring the effectiveness and user satisfaction of the system. More details can be seen from **Figure 2** and **Figure 3.**

Figure 2. System interface.

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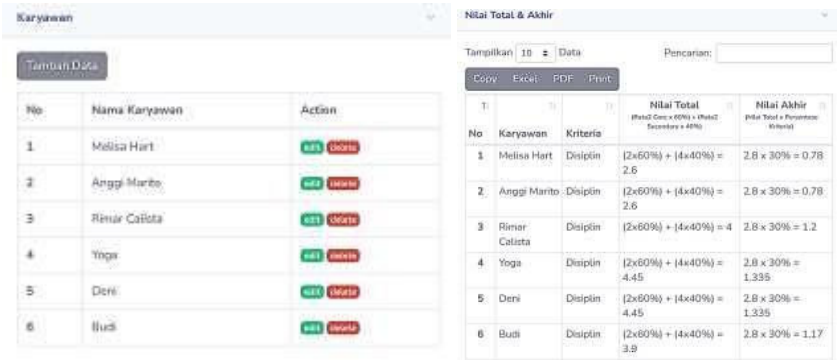

Figure 3. System interface.

3.2. BlackBox Testing

The blackbox testing method is commonly employed in software testing. To document the testing results, a blackbox table is used, facilitating systematic and structured testing. This table captures various test cases, along with their detailed information such as test scenarios, steps taken, inputs, and expected outputs (refer to **Table 1.**). By utilizing the blackbox table, the testing team can effectively track and analyze the testing outcomes, ensuring the application or system meets the predetermined requirements and specifications [16-20]. More details can be seen from **Table 1.**

Table 1. Login test.

Input Data	Expectation	Observation	Conclusion
System accessed. Edit text and login button Pressed	A login form will appear consisting of a username and password after that enter the user database validation.	Login interface. Displays a login form consisting of a username and password and can perform user validation	Accepted
Information	Display data in the form of employee information.	Displays data in the form of employee information	Accepted
Employee	Display an employee's data	Displays data in the form of employee information	Accepted
Choose to add data	Show details of adding employee data.	Successfully displays detailed data on the addition of employees	Accepted
Change analysis module.	It shows that the analysis module has registered	Shows the analysis module has registered	Accepted
Choose the delete button	Delete the selected sub criteria data.	Deletes the selected sub criteria data	Accepted
Process information	Display data in the form of process information	Displays data in the form of process information	Accepted
Select the Details button.	Show data	Displays detailed data	Accepted

3.3. SUS Testing

The decision support system software is tested through usability testing. To assess usability, the author utilizes the system usability scale (SUS), which is used to evaluate the overall usability of a system. The SUS test involves presenting users with ten questions and five alternative answer scales. These answers range from "strongly agree" to "strongly disagree" [10]. This is depicted in the following image, as shown in **Figure 4**.

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Responden	Skor Hasil Hitung (Data Contoh)										Jumlah	Nilai (Jumlah x 2.5)
	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10		
1	3	3	3	2	3	2	3	3	3	2	27	68
2	3	3	3	4	3	3	3	3	3	3	31	78
3	3	4	4	3	4	4	3	3	4	3	35	88
4	4	4	4	4	4	4	4	4	4	4	40	100
5	3	3	4	4	3	3	4	3	3	3	33	83
6	3	4	3	3	3	3	3	4	3	4	33	83
7	4	4	4	3	3	4	3	3	3	4	35	88
8	3	3	3	3	3	3	3	3	3	4	31	78
9	4	4	3	2	3	3	3	3	3	3	31	78
10	3	3	4	3	4	3	4	3	3	0	30	75
11	4	4	4	4	4	3	4	4	4	3	38	95
12	4	3	3	4	4	4	3	3	4	4	36	90
13	4	4	4	4	4	4	4	4	4	4	40	100
14	4	4	4	4	4	3	3	4	4	4	38	95
15	3	3	4	4	4	3	4	4	4	2	35	88
16	4	4	4	4	4	4	4	4	4	4	40	100
17	4	3	4	3	3	4	4	3	4	4	36	90
18	4	4	4	3	4	3	3	4	4	2	35	88
19	3	3	4	4	4	4	4	4	4	4	38	95
20	3	4	4	3	4	3	4	4	4	4	37	93
Skor Rata-rata (Hasil Akhir)												1748

Figure 4. Running system analysis.

The results of the SUS (System Usability Scale) test showed 87% and received an "Excellent" ive rating and received Grade "A". This means that in terms of usability or usability, this has been appropriate and acceptable to Una. And after being tested functional, this is also functioning properly and can produce Profile Matching calculations that are the same as manual calculations.

3.4. Profile Matching Test

The Profile Matching method is as follows:

1) Determine the criteria for the data needed.
2) Determine the aspects used for assessment

The following are the stages in using the Profile Matching Method:

1) Gap Profile Mapping. The gap referred to here is the difference/difference in the value of each aspect with the target value. The following is the profile gap mapping formula: Gap = Applicant Profile – Profile Value.
2) Weighting. After calculating the gaps for each applicant, then each employee profile is given a weighted value based on the gap value weight table.
3) Calculation and grouping of core factors and secondary factors. After determining the weight of the gap value, then each aspect is further divided into two groups, namely the core factor group and the secondary factor group. Core factors, criteria (competencies) that are most important or prominent or most needed by an assessment that is expected to obtain optimal results. Secondary factors are items other than those in the core factor.
4) Calculation of Total Value. From the calculation of the core factor and secondary factor of each aspect, the total value of each aspect is calculated which is estimated to affect

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the performance of each profile. Calculation of the total value can be shown in the equation [1].

$$N = (X)\%\ NCF + (X)\%NSF \quad (1)$$

Information :
N : The total value of each aspect
NCF : The average value of the core factor
NSF : Average value of secondary factor
(X)% : The percentage value that is inputted

5) Rank Determination Calculation The end result of the Profile Matching process is ranking. Determination of ranking refers to the results of certain calculations. Calculation of the total value can be shown in the equation [2].

$$Ranking = (x)\%\ Npd + (x)\%Nu + (x)\%Npg \quad (2)$$

Information :
Ranking : Final Result
Npd : Value of Educational Aspects
Nu : Age Aspect Value
Npg : Value Aspects of Experience
(X)% : The percentage value entered.

For example :
Unsatisfactory = 0
Needs repair = 1
Meet expectations = 2
Exceeded expectations = 3
Awesome = 4

Nama	CF 20% Loyalitas			SF 20% Kreatifitas			SF 20% Prestasi			CF 20% Komitmen			CF 20% Disiplin		
A	0	3	5.0	0	3	5.0	0	3	5.0	0	3	5.0	-1	4	4.0
B	1	2	4.5	1	2	4.5	0	3	5.0	0	3	5.0	0	3	5.0
C	-1	4	4.0	-1	4	4.0	0	3	5.0	0	3	5.0	1	2	4.5
D	1	2	4.5	-1	4	4.0	1	2	4.5	1	2	4.5	1	4	4.5
E	0	3	5.0	1	2	4.5	0	3	5.0	0	3	5.0	1	4	4.5
Rata-Rata		3			3			3			3			3	

Nilai Konversi GAP: *Core Factor*

Figure 5. Core factor.

GAP Conversion Value: Core Factor
A = (4.0 + 5.0 + 5.0) / 3 = 4.6
B = (5.0 + 5.0 + 4.5) / 3 = 4.8
C = (4.5 + 5.0 + 4.0) / 3 = 4.5
D = (4.5 + 5.0 + 4.5) / 3 = 4.6

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E = (4.5 + 5.0 + 5.0) / 3 = 4.8

GAP Conversion Value: Secondary Factor
A = (5.0 + 5.0) / 2 = 5
B = (5.0 + 4.5) / 2 = 4.75
C = (5.0 + 4.0) / 2 = 4.5
D = (4.5 + 4.0) / 2 = 4.25
E = (5.0 + 4.5) / 2 = 4.75

Table 2. Secondary factor.

Nama	CF + SF	Nilai Akhir	Hasil	Peringkat
A	(4.6*60%) * (5.0*40%)	2.76 + 2	4.76	2
B	(4.8*60%) * (4.75*40%)	2.88 + 1.9	4.78	1
C	(4.5*60%) * (4.5*40%)	2.7 + 1.8	4.5	3
D	(4.6*60%) * (4.25*40%)	2.76 + 1.68	4.44	4
E	(4.8*60%) * (4.75*40%)	2.88 + 1.9	4.78	1

4. CONCLUSION

The conclusions of the thesis research entitled "Decision Support System for Selection of Productive and Non-productive Employees at Sahabat Sampulo Foundation Using the Profile Matching Method" are as follows:

1) The researcher conducted an interview, the researcher concluded the user's needs based on the running system problems, the expected interface, and the desired output or output by the Sahabat Sampulo Foundation (YSS) to facilitate the selection of productive and unproductive employees. The needs of the Sahabat Sampulo Foundation include: The system that will be created is expected to have an interface that is easily understood by users or user experience. The system that will be created can provide the results of selecting productive and unproductive employees effectively and efficiently. The system that will be created can provide results that can be relied upon by Managers in selecting productive and unproductive employees.
2) Based on the results of the questionnaire, it can be concluded that 80% of the presentation of concise and direct information is achieved with an interface that is easy to use and understand and predictable with a percentage of 60%. The navigation mechanism runs well with a percentage rate of 40-80%, and with the application function running properly with a percentage result of 80%.
3) In the Profile Matching Method, all criteria have a specified weight. So that it is likely to have an influence on the assessment therein.
4) The test results of the System Usability Scale (SUS) on this system are 87.4 with grade "A", this shows that this system is feasible to use and can facilitate solving the problem of selecting productive and unproductive employees at the Sahabat Sampulo Foundation.

5. AUTHORS' NOTE

The authors declare that there is no conflict of interest regarding the publication of this article. Authors confirmed that the paper was free of plagiarism.

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