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Monitoring System

Development of Babinsa 0205/TK Performance Monitoring System using Copras Complex Proportional Assessment Method

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A B S T R A C T

This study aims to develop a performance monitoring system for Babinsa 0205/TK utilizing the COPRAS (Complex Proportional Assessment) method. COPRAS, a Multi-Criteria Decision Analysis (MCDA) technique, allows for the evaluation of performance based on various criteria such as discipline, initiative, and communication skills. The system is designed to provide an objective and proportional assessment of Babinsa performance by assigning weights to each criterion and calculating the overall score. The development of this system has demonstrated improved accuracy in performance evaluation and enhanced transparency, providing a solid foundation for decision-making in performance management. The implementation of this system is expected to enhance the effectiveness of monitoring, accountability, and performance improvement for Babinsa, thereby supporting better execution of duties at the village level.

INTRODUCTION

In the ever-growing digital era, the use of technology has become an inseparable part of everyday life. The employment sector is no exception, where technology has brought about very significant changes. Activities carried out by the Babinsa Kodim 0205/Tanah Karo help the community in their daily activities or on certain days if needed, for example, Babinsa helps the community in their daily activities or on certain days by working together with local residents. Babinsa activities also help people who are having difficulties in a situation if a disaster occurs, Babinsa can immediately help people who need help, for example, a child is swept away in one of the rivers in Tanah Karo, then Babinsa and other soldiers will search until they find the victim.

In addition, the role of Babinsa in daily activities also secures the area that has been assigned to each Babinsa so that unwanted things do not happen, such as if at an event in a village to carry out religious activities or celebrations involving many residents in the village, the Babinsa is on standby to keep it safe and if there is an unwanted problem, it is immediately secured by the Babinsa. Babunsa activities also monitor the surrounding environment if a natural disaster occurs, the Babinsa helps so that the community is immediately saved and provides assistance to people who need help.

Data collection and determination of Babinsa activities previously only used manual methods such as WhatsApp, social media, and print media. So when data is collected using the previous method, it requires more storage space because when we send messages and images on WhatsApp, WhatsApp will also back up, not a few Babinsa turn off the automatic

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download feature so that when images are sent by other people on WhatsApp via groups or privately, they will be saved automatically which will take up a lot of storage space on their phones.
Likewise, data collection and Babinsa activities using social media methods will take up a lot of space and quota because after data collection is carried out in one of the applications such as WhatsApp, it will be uploaded to social media such as Instagram, Twitter, Facebook and others.

This study uses the COPRAS (Complex Proportional Assessment) method as a multilevel assessment to evaluate alternative methods in terms of importance and usefulness. The COPRAS method has the ability to consider positive and negative criteria, which can be evaluated separately in the evaluation process [1,2,3]. COPRAS has the advantage of solving choice problems by calculating alternative care rates. Alternative care rates indicate how well an alternative is better or worse than another alternative through a comparison process.

METHOD

COPRAS (Complex Proportional Assessment) Method

According to [4,5] COPRAS is a method based on the ratio of favorable criteria and unfavorable criteria. It is also necessary to define alternatives through needs, then determine favorable criteria and unfavorable criteria. Favorable criteria are criteria that if the value of the criteria is higher, the impact on the calculation of alternative preparation will be increasingly taken into account.

The COPRAS method was first presented by [6] hich was used to handle information more efficiently, then continued with research by [7] applying the COPRAS method for multiple criteria analysis. Podvezko's research [8] made a comparison between the SAW method and the COPRAS Research method.

System Modeling

System modeling is one of the most important elements in designing a system or application. The modeling used to describe the system to be designed is using a unified modeling language, namely use case diagram, activity diagram, and class diagram. The following is the modeling and design of the system.

1. Admin Login Skenario
   The following is a scenario of the Admin login of the designed decision support system.
2. Manage Criteria Data Scenario
3. Criteria Data Saving Scenario
4. Scenario Changing Criteria Data
5. Alternative Management Scenarios
6. Alternative Data Storage Scenario
7. Scenario Changing Alternative Data
8. Alternative Data Deletion Scenario
9. Copras Process Scenario
10. Scenario for Printing Report Results

System Design

In a system, the interface design depends on the system model that has been designed, including the input form, process form, and output form. This is a plan for balancing the Babiinsa 0205/Tk performance monitoring system with the Meitodei Compleix Proportional Asseissmeint (COPRAS).

1. Database Design
   Database design is used to be able to view tables or fields used to meet system needs.
2. Interface Design

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RESULTS AND DISCUSSION

Analysis Results Using the COPRAS Method

In this phase, the procedures and results of the analysis using the COPRAS Method will be explained comprehensively. The completion at this stage is carried out based on the framework that has been prepared.

The following are the steps for solving using the Complex Proportional Assessment (COPRAS) Method in conducting the monitoring assessment of Babinsa 0205/TK performance based on the framework above:

1. Creating an Initial Decision Matrix
   In this step, a matrix is prepared containing the alternatives to be evaluated and the criteria used for the evaluation, the following is the complete initial decision matrix.
2. Perform Matrix Normalization
   This stage is to change the values in the decision matrix into a uniform scale so that they can be compared with each other. Based on the matrix above, the number of values in column K1 is 1900. For column K2, the number of values recorded is 1885. In column K3, the total calculated value is 1694. Column K4 has a total value of 1921. Finally, in column K5, the number of values collected is 1935.

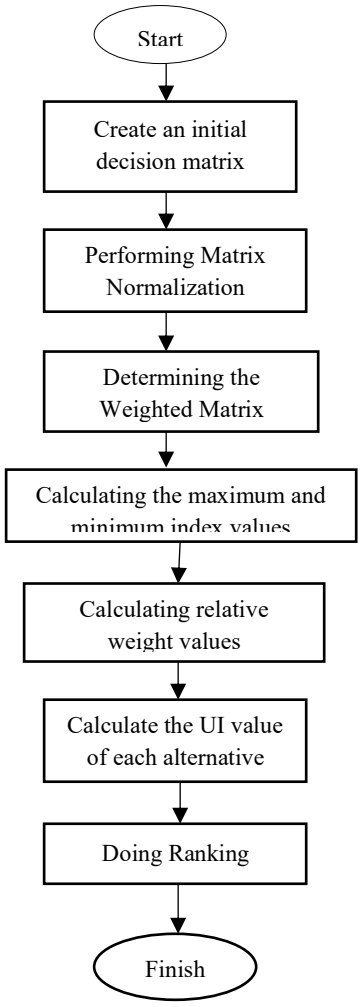

Figure 1. COPRAS Method Framework

Interface Display Results

This section contains images that display the interface design results of all pages in the designed decision support system. The following are the interface display results of the decision support system that was built:

1. Login Page View
   On the login page, the admin will be asked to enter a username and password. The following is a complete view of the login page.

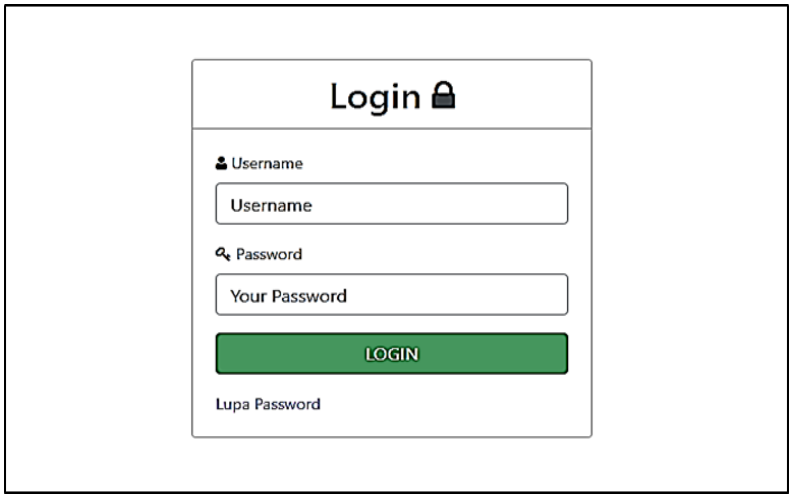

Figure 2. Login Page View

2. Main Menu Page View
   This main menu view has menus that are useful for calling other data forms. The following is a complete view of the main menu page.

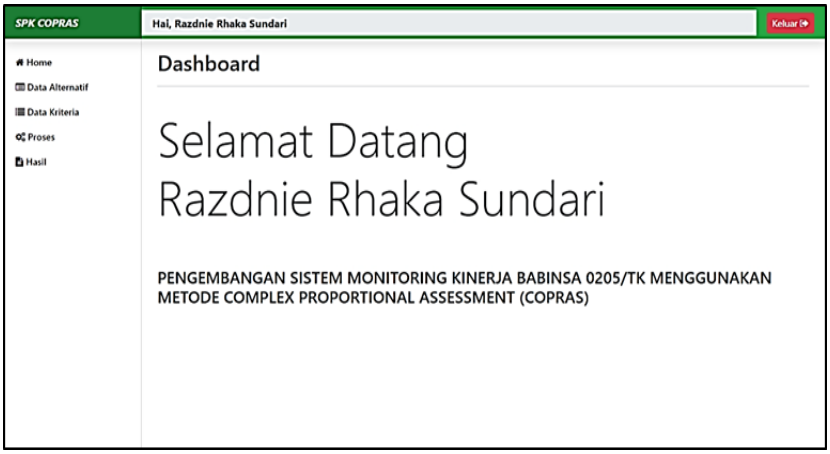

Figure 3. Main Menu Page View

3. Alternative Data Page View
   The alternative data page has an add data button that functions to save data. The following is a view of the alternative data page.

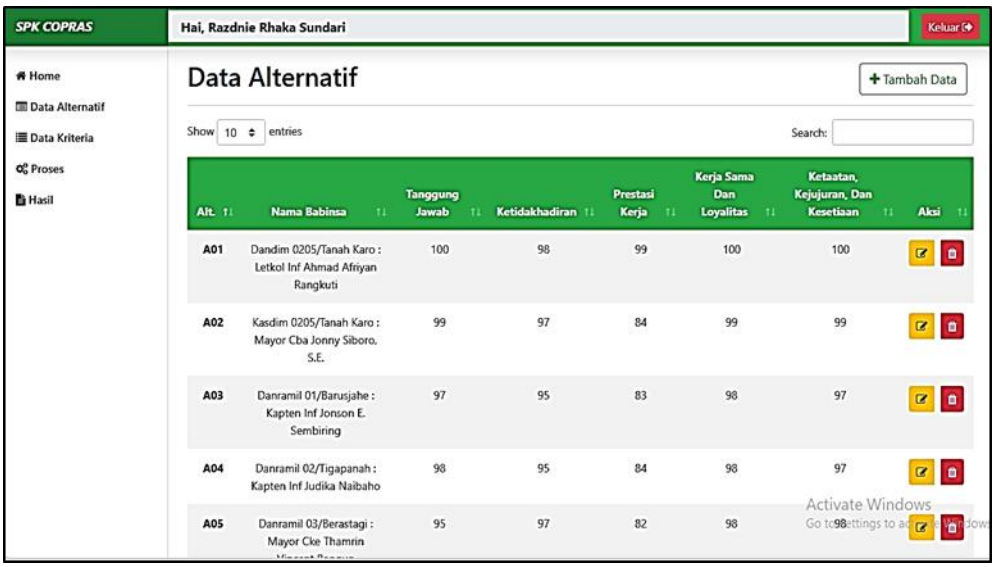

Figure 4. Alternative Data Page View

4. Criteria Data Page View

On this process page, the admin can manage criteria data related to edit and delete input. Here is a complete view of the criteria data page.

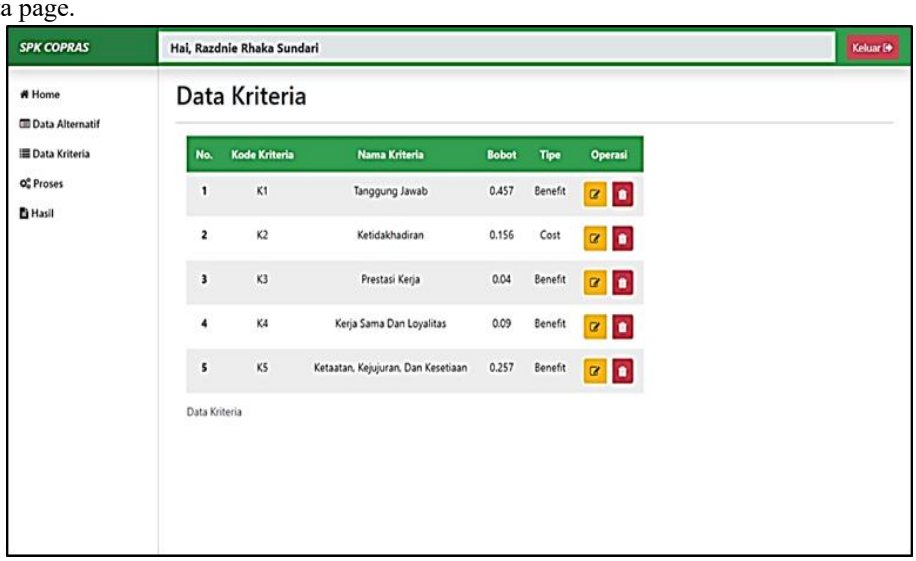

Figure 5. Criteria Data Page View

5. Copras Process Page View

This process page view can be used by the admin to perform the Copras process which will be automatically carried out by the system. The following is a view of the complete Copras process page.

Figure 6. Copras Process Page View

6. Copras Process Result Page Display
   This page displays the data processing results using the Copras method. The following is a complete display of the Copras process result page.

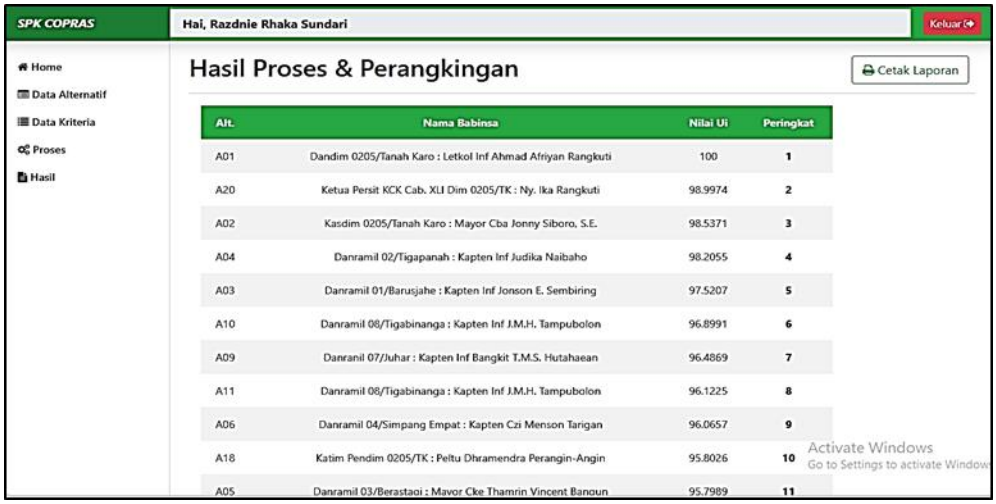

Figure 7. Copras Process Result Page Display

System Testing Results

System testing was conducted by applying the Black Box Testing technique, which is designed to assess whether all displays and functions in the developed application work as expected. This technique focuses on testing from the user's perspective without considering the internal structure of the application. The results of this evaluation show the performance of the Babinsa 0205/TK Performance Monitoring System, which has been analyzed using the Complex Proportional Assessment (COPRAS) method. This method is used to comprehensively assess and compare various criteria in the system, providing a clear picture of the effectiveness and efficiency of the system being tested.

Write results in logical sequence. Results with important findings should be present first. When presenting results in a table or figure, do not repeat all those contents in the text. Present only the summary of the text. Describe only new and important aspects of the study. Do not repeat all information from results section or any section above. Present limitations of the study. Write the issues that are new or unsolved, for future research. This section consists of the information on What/How the presented data were produced, no raw data should be present in the article. The produced data are presented in tables, or figures with an explanation of what is the result/findings from the work. The section will also need to address connections between findings and basic concepts or hypothesis made earlier. Authors should also express whether any arguments were needed relating to other works from other researchers. Write implications made by the work related to theoretical or applications.

System Identification

Analysis of the advantages and disadvantages of the Babinsa 0205/TK performance monitoring system, which was built using the Complex Proportional Assessment (COPRAS) method, will be described in the following description. The advantages and disadvantages of the Babinsa 0205/TK performance monitoring system using the Complex Proportional Assessment (COPRAS) method that has been built are as follows:

1. System Advantages
   The system that was built has several advantages, the advantages of this system are as follows:
   a. The system is able to process large amounts of data automatically, quickly and accurately.
   b. This decision support system is easy to operate, so users will easily understand how to use the system.
   c. The calculation results based on the Copras method produced by the system are quite good.
   d. The responsive system display allows it to be used on various devices such as smartphones, PCs, tablets and others.
2. System Advantages
   The system that was built has several advantages, the advantages of this system are as follows:
   a. The system is able to process large amounts of data automatically, quickly and accurately.
   b. This decision support system is easy to operate, so users will easily understand how to use the system.
   c. The calculation results based on the Copras method produced by the system are quite good.
   d. The responsive system display allows it to be used on various devices such as smartphones, PCs, tablets and others.
3. System Weaknesses
   This application certainly still has several weaknesses, the weaknesses of this application are as follows:
   a. The results of this decision support system test can only be used at Dandim 0205/Tanah Karo.
   b. This application is limited to assessing the performance of Babinsa at Dandim 0205/Tanah Karo using the Copras method.
   c. This system is not equipped with good data security because it is not equipped with a data security algorithm.

CONCLUSION

Based on the results of the analysis of the case raised regarding the development of the Babinsa 0205/TK performance monitoring system using the Complex Proportional Assessment (COPRAS) method, the following conclusions can be drawn:

1. Based on the results of the analysis, the Complex Proportional Assessment (COPRAS) method in assessing the performance of Babinsa 0205/Tanah Karo, provides quite good results.
2. The results of the study indicate that the Complex Proportional Assessment (COPRAS) Method approach can be applied to support the Babinsa 0205/Tanah Karo performance assessment process. In addition, the application of the ROC weighting concept significantly increases objectivity in giving weight to each criterion used.
3. This study reveals that the application of the Complex Proportional Assessment (COPRAS) Method in the Babinsa 0205/TK performance assessment system has proven effective in determining the weight and final value for each alternative that has been set. In the context of evaluating the performance of Babinsa 0205/Tanah Karo, alternative A01 led by Dandim 0205/Tanah Karo, Lieutenant Colonel Inf Ahmad Afriyan Rangkuti, stands out as the Babinsa with the best performance, with a Uii value of 100.

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