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Determination of Eligibility for Employee Transfers Using the Mabac Algorithm

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A R T I C L E I N F O

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A B S T R A C T

Employee transfer is a common activity in an organization. The transfer is intended to position the employee in the right group so that the employee will obtain job satisfaction while also providing maximum performance. The difficulties detected in this study are the large number of employees, which makes it difficult for the management to make decisions in a fast time. To solve the problems identified in this study, the authors are interested in designing the feasibility determination for employee transfers by applying the MABAC method. MABAC stands for Multi-Attributive Border Approximation Area Comparison. MABAC was proposed by Pamucar and Cirovic. The basic concept of the MABAC method is viewed from the basis of the distance function criteria from each alternative which is seen from the prediction area of the border. Based on the results of the application of the MABAC algorithm for the employee mutation process involving 60 alternatives with 8 assessment criteria, the decision was obtained that the employee selected for employee transfer was A19.

1. Introduction

Employee transfer is a common activity in an organization. The employee mutation in question is placing employees in the right group position so that these employees get job satisfaction and provide maximum achievements [1]. Employee transfer activities have many benefits and goals that will have a positive impact on employee competencies and work intentions which can be profitable for the agency itself [2]. In an agency, the decision-making procedure for determining employee transfers is carried out based on predetermined criteria. The problem detected in this research is the large number of employees, which makes it difficult for management to make decisions quickly.

*Artificial Intelligence*is a branch of computer science that can be used in various fields, including for decision making [3][4]. Artificial Intelligence is a form of information and communication technology development that has emerged in the last ten years [5]. Simply put, a system that uses the concept of an intelligent system can imitate human work, such as thinking, classifying data, and making decisions [6][7].

*MABAC*is a method that can solve multicriteria decision making [8]. MABAC was discovered and developed by Pamucar and Cirovic [9]. The principle of the MABAC method is reflected in the concept of distance function criteria for each alternative that is considered in the border prediction area [10]. In previous studies, MABAC has been used for decision making in several different cases and it is concluded that MABAC has good ability in ranking alternatives based on an assessment of several criteria [11][12][13].

In a study conducted by Guiwu Wei, et al. (2019) regarding the selection of suppliers of medical consumption products applying MABAC concluded that MABAC successfully resolved the problem of selecting suppliers of medical consumption products accurately [14]. Research conducted by Saima Ronita Purba (2020) on solving decision-making problems for selecting the best doctor using the MABAC method concluded that MABAC can accurately and reliably select the best doctor [15]. Rinaldy Manurung in 2020 conducted research by applying the MABAC method to solve the problem of selecting the target company. From the results of the research conducted, it is concluded that the MABAC method can provide fast and

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accurate decision results to solve the problem of choosing the target company [16].

2. Research methods

2.1 Research Framework

In this section, the researcher explains this framework for solving the problem to be studied. The research framework used by the author in this study can be seen as the concept that has been optimally arranged in Figure 2 below:

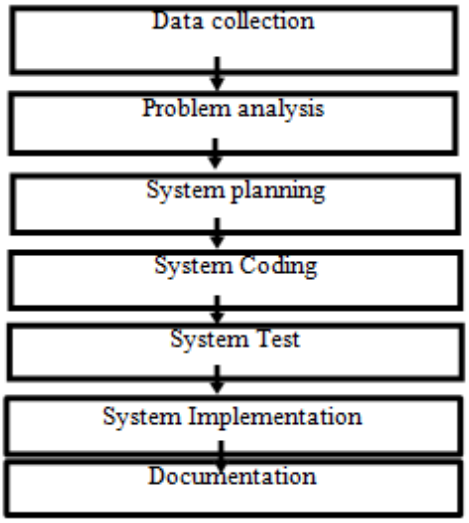

Fig 1 Waterfall Model

2.2 Data collection

The data collection in this step is explained using the interview and observation method to obtain the data and information needed for the problem solving process in this research.

a. Observation
   The process of observation carried out in this study by observing directly the operational activities for the Employee Transfer process
b. Interview
   The process of collecting data with interview techniques is carried out to related parties using the interview method to obtain information in the form of data related to employee mutations

2.3 Problem analysis

In this step, the writer analyzes the data that has been obtained from the data collecting process in order to get the problems that are happening in the employee mutation procedure at the research site.

2.4 System planning

In this step the author designs a good system and this system conceptually is the operating logic in the data management process and the process as a support for the system operating process.

a. System Logic Design
   The system logic design is the step taken by the author to create a system flow in determining eligibility for employee transfers applying the MABAC method in this study using UML.
b. System Interface Design
   In this step, the author designs a system interface that will be used as a tool for interacting by the user by determining the eligibility for employee transfers using the MABAC method that will be built in this study.
c. System Coding
   At this stage, the author applies the program code to determine eligibility for employee transfers using the MABAC method that has been designed so that what will be built can be used to solve the problem of employee transfers in this study.
d. System Test
   System Test namely the next step carried out by the author to test the determination of eligibility for

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employee transfers applying the MABAC method that has been built in order to find out the shortcomings of the system that has been built in this study to be developed in further research.

e. System Implementation
This stage is an activity carried out by the author to implement the system that has been built to solve the problem topic in the real employee mutation process.

f. Documentation
Documentation is the stage carried out by the author to compile a research report based on research that has been completed.

3. Research Results and Discussion

3.1 Research result

Next is the result of making Eligibility Determination for Employee Transfer using the MABAC algorithm.

a. Login Page
Page *Login* is the system interface as the initial interface when the decision support system is first run by the user. The display of the login form for Eligibility Determination for Employee Transfers designed in this study is shown in Figure 2

:

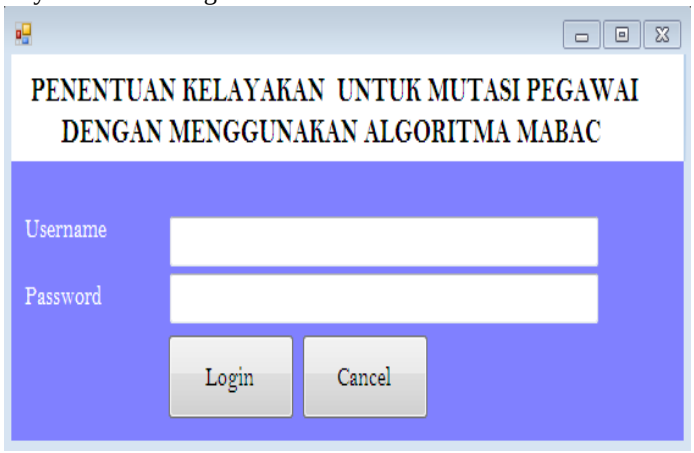

Fig 2 Login Interface

b. Main Menu Page
Interface The main menu is the system interface that appears after the user logs into the system. The main menu form display on the designed system is shown in Figure 3 below:

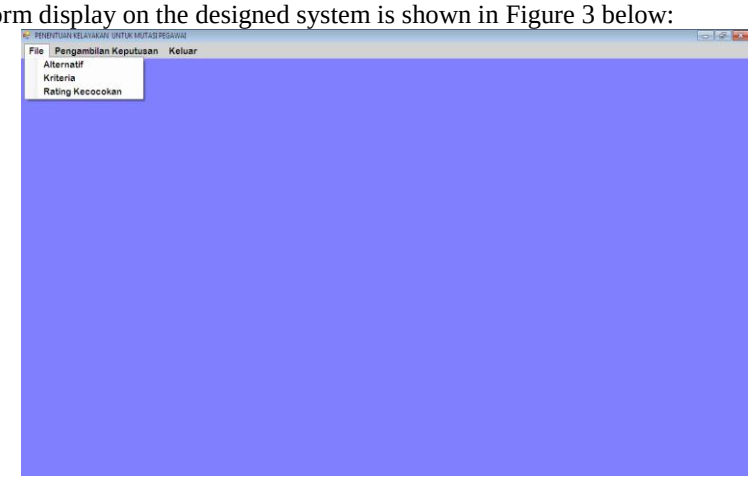

Fig 3 Main Menu Interface

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c. Alternative Page

Alternative page is a form that appears when the user opens an optional sub menu on the file menu. An alternative form display on the created system is shown in Figure 4:

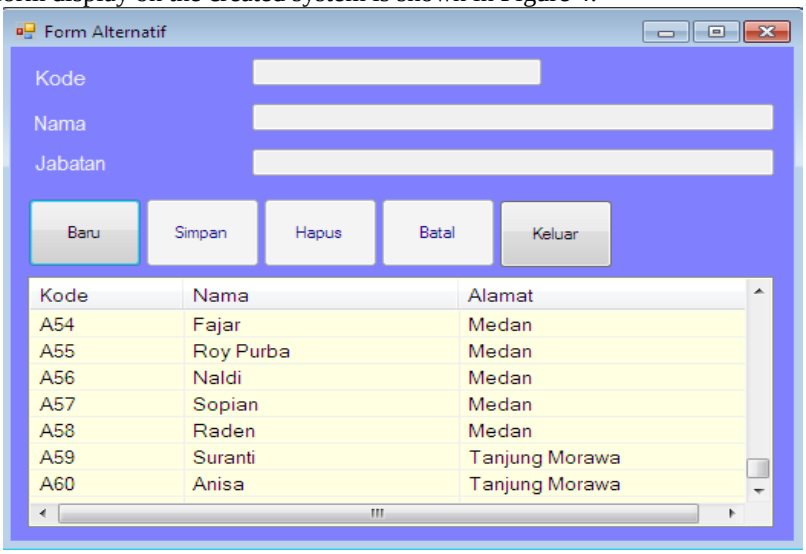

Fig 4 Alternative Form

d. Criteria Page

The criteria page is the page that appears when the user opens the file menu and on the criteria sub menu. The criteria page display on the designed system is shown in Figure 5 below:

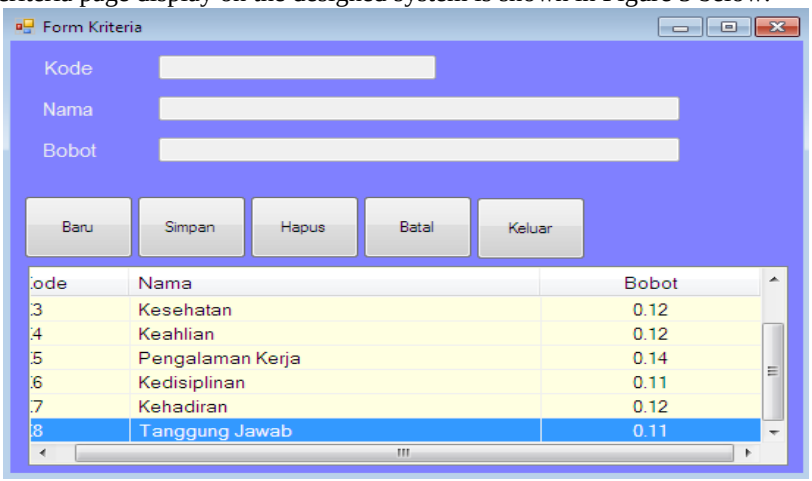

Fig 5 Criteria Form

e. Match Rating Page

The match rating form is the display that opens when the user selects the match rating submenu on the options in the file menu. The appearance of the compatibility rating form on the system that has been designed can be seen in Figure 6:

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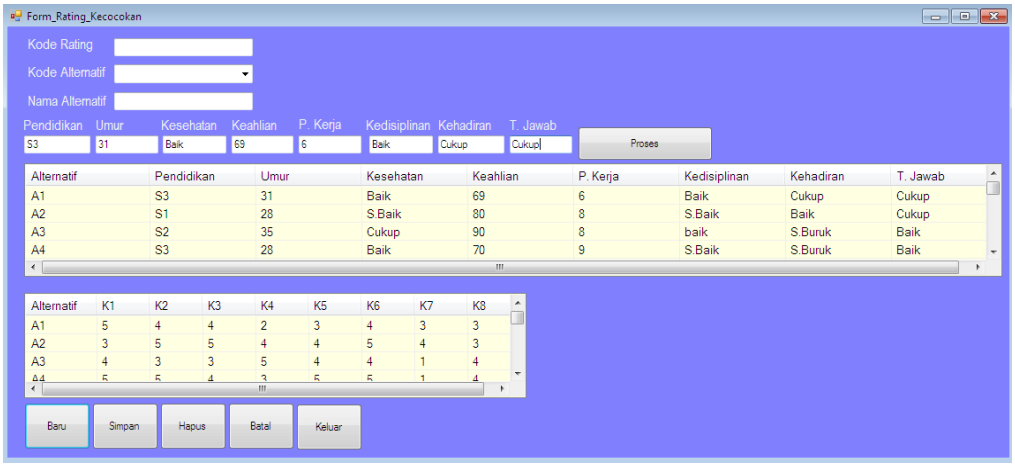

Fig 6 Match Rating Form

f. Decision-making

The decision-making page is a system design that appears after the user accesses the decision-making menu on the main menu. The decision-making page interface on the Eligibility Determination system for Employee Transfers made in this study is shown in Figure 7:

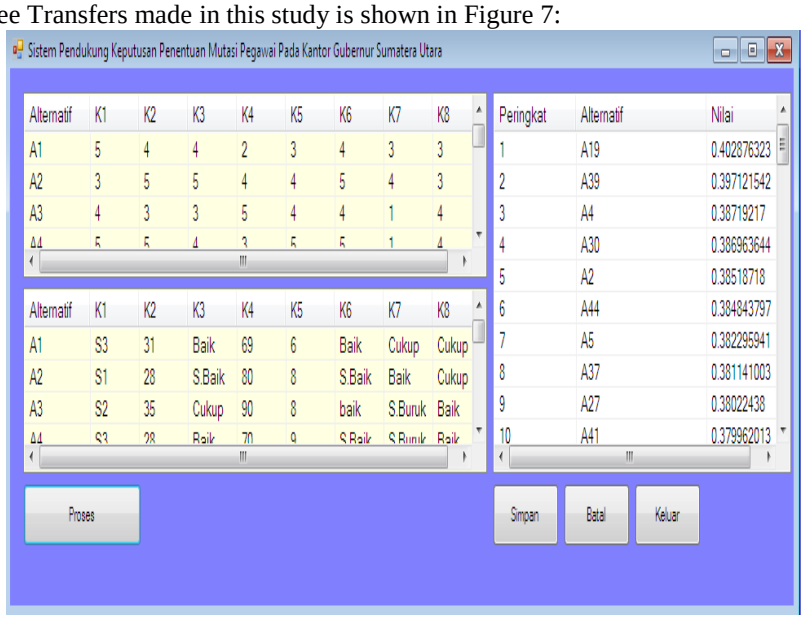

Fig 7 Decision Making Form

Based on the results of decision making that can be seen in the Fig above, it can be concluded that the employee selected for employee transfer is A19.

3.2 Discussion

The Employee Transfer Procedure is carried out by selecting the best alternative from all alternatives that are candidates for employee transfer. Decision making for employee transfers carried out refers to the criteria used as a reference.

In this study, the authors designed the determination of eligibility for employee transfers using the MABAC algorithm to help decision makers to solve problems quickly and precisely.

Based on the results of the application of the MABAC algorithm for the employee mutation process involving 60 alternatives with 8 assessment criteria, the decision was obtained that the employee selected for employee transfer was A19. The complete report for the final results of employee transfer decisions that have been carried out by applying the MABAC method is seen in table 1.

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Table 1
Result Ranking

RANKING RESULTS		
Rank	**ALTERNATIVE**	**Mark**
1	**A19**	**0.402876323**
2	A39	0.397121542
3	A4	0.38719217
4	A30	0.386963644
5	A2	0.38518718
6	A44	0.384843797
7	A5	0.382295941
8	A37	0.381141003
9	A27	0.38022438
10	A41	0.379962013
11	A20	0.378467115
12	A38	0.377718619
13	A53	0.374873606
14	A35	0.373793623
15	A54	0.372233441
16	A21	0.371514406
17	A31	0.370560284
18	A13	0.36887331
19	A42	0.368859391
20	A55	0.367783103
21	A45	0.361694168
22	A33	0.361681073
23	A47	0.361017034
24	A32	0.360855606
25	A15	0.360147052
26	A1	0.358520451
27	A49	0.356787484
28	A18	0.356561546
29	A36	0.355920654
30	A16	0.355094474
31	A9	0.354005683
32	A3	0.353944199
33	A24	0.353540038
34	A40	0.35097842
35	A23	0.350799208
36	A14	0.349937936
37	A51	0.347720435
38	A25	0.34492288
39	A22	0.343215071
40	A46	0.339346484
41	A29	0.338019335
42	A43	0.337473086
43	A28	0.336851343
44	A60	0.336769668
45	A59	0.336211824
46	A11	0.335024844
47	A57	0.33424216
48	A10	0.333518868
49	A52	0.330144866
50	A7	0.330008722

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RANKING RESULTS		
Rank	**ALTERNATIVE**	**Mark**
51	A26	0.327963865
52	A48	0.326111642
53	A8	0.325155141
54	A6	0.324233065
55	A58	0.323094984
56	A56	0.317829353
57	A50	0.317080569
58	A17	0.31263354
59	A34	0.311926982
60	A12	0.288993346

Below is an output graph to illustrate the results of the decisions that have been made to determine eligibility for employee transfers:

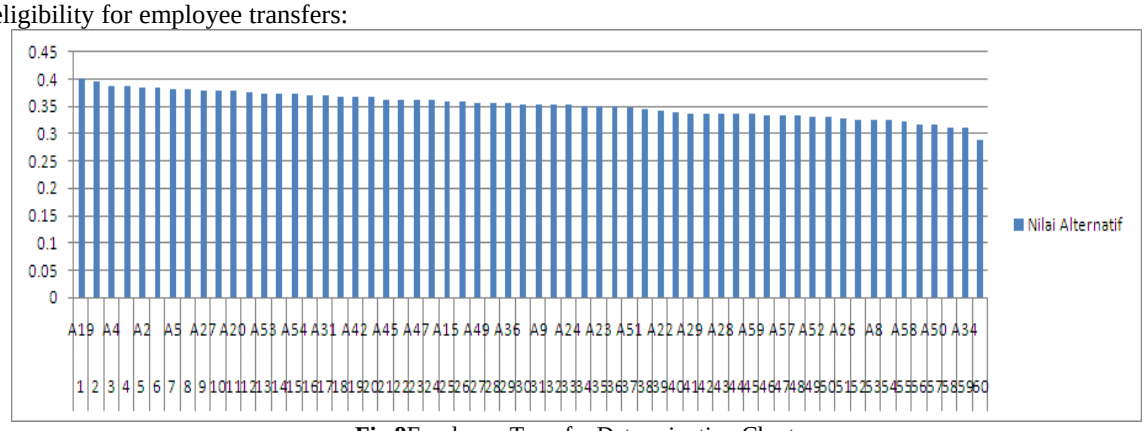

Fig 8 Employee Transfer Determination Chart

4. Conclusion

Based on the results of research that has been carried out by researchers, the following conclusions can be drawn:

a. Determination of eligibility for employee transfers in this study involved 60 alternatives and 8 assessment criteria
b. The application of the MABAC method can complete decision making for determining eligibility for employee transfers.
c. The results of this study get the final decision with the election of A19 with the highest score (0.402876323) as an alternative that is worthy of getting employee transfers.

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