

DECISION SUPPORT SYSTEM IN DETERMINING THE TOPIC OF THE FINAL PROJECT, SUPERVISORS, AND CASE STUDY STUDENTS OF THE FACULTY OF INFORMATION TECHNOLOGY, AISYAH PRINGSEWU UNIVERSITY WITH THE EXPONENTIAL COMPARISON METHOD (MPE)

Ockhy Jey Fhiter Wassalam¹, Zulkifli², Tresna Yudha Prawira³, Ummul Hairah⁴, Ferly Ardhy⁵,


Faza Alameka⁶, Fitra Endi Fernanda⁷, Salman Alfarisi Salimu⁸

^{1,2,5,7,8} Aisyah Pringsewu University, Indonesia

³Stimik Muhammadiyah Paguyangan Brebes

⁴Mulawarman University

⁶Mulia University

Article Info	ABSTRACT
Keywords: System Information SPK MPE MySQL	ABSTRACT <i>Abstract-information technology does bring a lot of conveniences that can be experienced in human life. An example of the era of information technology is the introduction of computers into people's lives. The computer is now considered a device that provides many benefits that are inseparable from human life. In every company or institution, data processing is done with a computer. Therefore, computers can be used as aspects of supporting good and right decision-making to make decisions. So that the research work that the authors do refers to the application of the exponential comparison method (MPE) in determining the topic of the final project, lecturers and students of the Department of Information Technology at Aisyah Pringsewu University aim to make decisions in the selection of the final project topic, lecturers and students according to the criteria at Aisyah Pringsewu University. A Decision Support System (SPK) is needed to find the value of student topics from each criterion identified by Aisyah Pringsewu University for the decision-making process. Applying the exponential comparison method (MPE) by using the criteria set by the campus, namely registering as an active student, completing a minimum of 100 credits, conducting research, and writing final project discussions. The final project topic selection decision support system, for lecturers and students, was built by the author using PHP programming language and using MySQL database running on the Windows operating system.</i>
	<p>This is an open-access article under the CC BY-SA license.</p> 

Author Correspondence:

Ockhy Jey Fhiter Wassalam
Software Engineering Study Program
Aisyah Pringsewu University, Indonesia
Email: ockhyjey@aisyahuniversity.ac.id

1 INTRODUCTION

The final project is a term used by scholars in Indonesia to refer to scientific papers written by students as a prerequisite for completing university programs. This final project aims to train students with the ability to write scientific papers in their fields of science. Students who complete their scientific work are considered to have combined skills in understanding, analyzing, describing, and explaining problems related to the field of science they are engaged in. The final project is one of the graduation requirements for students enrolled in undergraduate programs at universities, both public and private. As a scientific work, the topic of the final project is subject to certain rules, one of which is that plagiarism is prohibited. In writing the final project, it is necessary to have a tutor, or teacher who acts as a director or reviewer of scientific articles so that the work does not exceed the science of the field of presentation. The head of the study program also has the right to appoint someone to supervise and compare to complete writing scientific articles.

Based on this explanation, a supervisor should be selected related to the final project work contributed by students so that the topic concerned can be guided by a competent supervisor according to the topic of discussion in the final project field. Currently, in the process of submitting the final project topic, lecturers and students are still doing it manually, so later it must be done by the system, it will be done by the exponential comparison method, the system built will use the following Those are some of the criteria needed to apply for a degree at the Faculty of Informatics Engineering, Aisyah Pringsewu University.

Based on this criterion, students will get a good topic to use, and the right supervisor, so students don't need to do it manually anymore. In determining the topic of the final project later, several criteria are needed to choose the final project topic, these criteria will be used to calculate the MPE, and each criterion to make the most suitable topic is made by the supreme student, after choosing the final project topic, the supreme Students are selected to identify instructors and comparison instructors based on criteria determined by the Faculty of Informatics Engineering so that the result is that when students are selected, the final project topic, supervisor and students will be obtained.

2 RESEARCH METHODS

2.1 Exponential Comparison Method (MPE)

This method is usually used for ordinal scale assessment (very good, good, less, very less). The exponential comparison method has the advantage of reducing bias that may occur in performing the analysis. The score value that describes the priority order becomes large, which results in the priority order of decision alternatives becoming more real. In decision-making using the exponential comparison method, several procedures must be carried out, including;

1. Develop alternative decisions to be chosen.
2. Determine criteria or comparisons of decision criteria that are important to evaluate.
3. Determine the importance of each decision criterion or consideration of the criteria.
4. Assess all alternatives on each criterion.
5. Calculates the score or total score of each alternative.
6. Determine the order of priority of decisions based on the score or total score of each alternative. The formula used in the calculation of the exponential comparison method is as follows;

Total value (TNi) = $\sum (RK_{ij}) \cdot TKK_j$ (1) $m, j=1$

Information;

TNi = Total i-th alternate value

RKij = Degree of the relative importance of the j-th criterion on the choice of Decision i

TKKj = Degree of the relative importance of the j-th decision; $TKK_i > 0$; round

n = Number of decision choices

m = Number of criteria

2.2 UML

Unified Modeling Language is a standard language widely used in the industrial world to define needs, analyze and design, and describe architectures in object-oriented programming. UML has also been used as a standard for visualization, planning, system documentation, and plan generation. UML version 1.0 was originally created in January 1997 by the Object Management Group. With UML, it is expected that software development will be easier and able to meet all user needs. Because planning and modeling are prepared with a structured beginning of a good system.

2.3 Usecase Diagram

The use case diagram used in building the system can be seen in Figure 1.

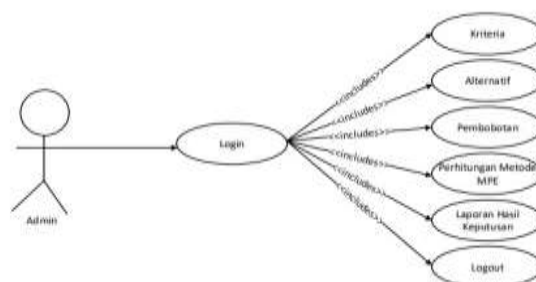


Figure 1. Admin Diagram Usecase

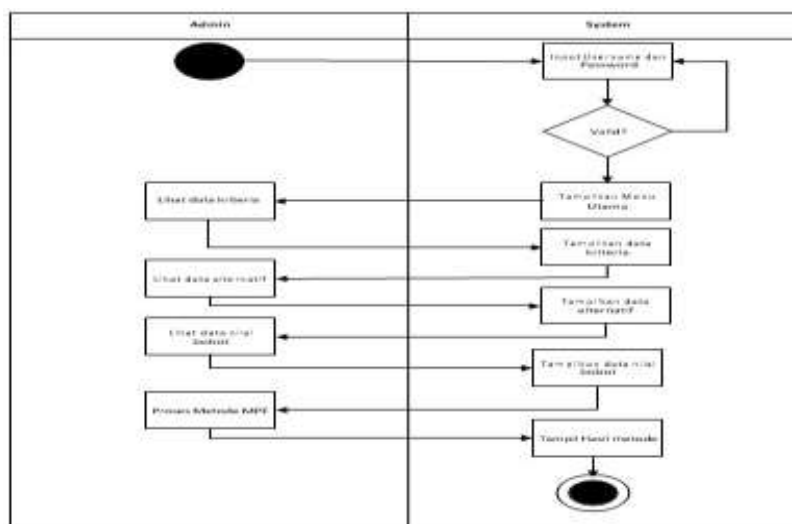
A more detailed explanation of the *admin diagram's use case* can be seen in.

Table 1.

Name	Usecase Diagram
Actor Admin	Admin
Description	<ol style="list-style-type: none"> The admin first logs into the system by accessing the admin page Admins Access the Criteria Page Admin Access Alternate page Admin Access the supervisor division page Admin Access the decision report page which will be used as a reference for taking final project topics and supervisors Admin Access log out from the system

2.4 Activity Diagram

Figure 2 is the Activity diagram of the application built



Gambar 2. Admin Main Menu Activity Diagram

2.5 Sequence Diagram

The Admin Sequence Diagram can be seen in Figure 3.

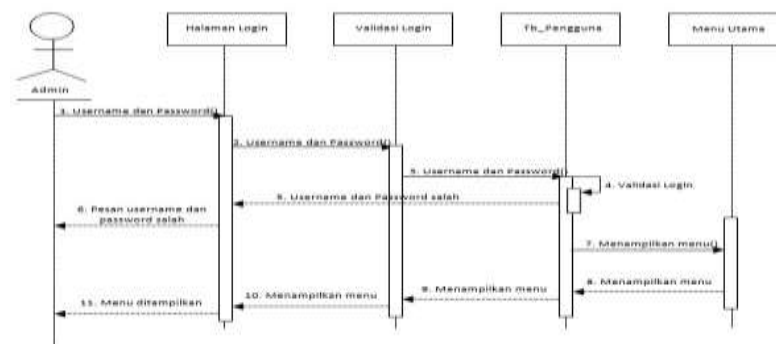


Figure 3. Sequence Diagram Admin

3 RESULTS AND ANALYSIS

3.1 Login Page

This page is used to log into the system, on this page validation is carried out on whether the username or password entered is correct or not, as can be seen in figure 4.



Figure 4. Login Page

3.2 Lecturer Data Page

This area is used to input lecturer data, the lecturer data inputted is the lecturer data who will be the supervisor, as can be seen in figure 5.

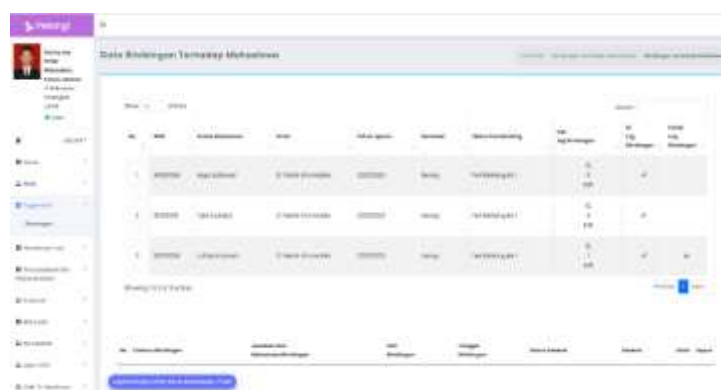


Figure 5. Lecturer Data Page

3.3 Final Project Guidance Log Page

This page is used to input student data when conducting guidance and lecturers can enter the results of notes as supervisors can be seen in figure 6.



Figure 6. Final Project Guidance Log page

3.4 Final Project Topic Criteria

This area is used to fill in the data on the topic of the final project, which can be seen in figure 7.



Figure 7. Final Project Topic Criteria page

3.8 Decision outcome criteria

This area is used to display decision data on the results of the final project topic and the right lecturer to guide students, as can be seen in figure 8



Figure 8. Decision Results Page

3.9 Print Report Pages

This page displays the report data on the results of the decision on the selection of the final project topic and the supervisor, which can be seen in figure 9.



Figure 9. Print report page

4 CONCLUSION

Based on the implementation of the system at the Faculty of Informatics Engineering, Aisyah Pringsewu University, the following conclusions can be drawn:

1. The system built can help in determining topics and supervisors to assist students in completing final projects or theses.
2. Systems built into decision-making already use the exponential comparison method.
3. The system can provide information on decision results based on the criteria determined to determine the topic of the final project and supervisor.

REFERENCE

- [1] Borman, R. I., & Fauzi, H. (2018). In the decision support system of scholarship recipients. *CESS : Journal of Computer Engineering, Systems, and Science*, 3(1), 17–22.
- [2] R Cristian, Ery Dewayanti, Z.R. (2019). The decision support system selects investment firms using the exponential comparison method. *Journal of Computer Science and Information Systems*, 211–215..
- [3] Devianto, Y., & Dwiasnati, S. (2018). Application of Community Satisfaction Index Decision Making with Exponential Comparison Method (MPE) in Community Service Units with Microcontroller Tools as Survey Tools. *FIFO Scientific Journal*, 10(1), 13.
- [4] Fitriyani, F. (2016). Implementation of *FpGrowth algorithm* using *association rule in market basket analysis*. *Journal of Informatics*, 2(1). <https://doi.org/10.31311/ji.v2i1.85A>.
- [5] Kristina, T. (2018). Decision support system using the TOPSIS method for site selection of pulse wholesale establishment. *Paradigm*, 20(1), 8–12.
- [6] <https://ejournal.bsi.ac.id/ejurnal/index.php/paradigma/article/view/2908> Kurniawan, T.A. (2018). Use Case Modeling (UML): Evaluation of some Errors in Practice. *Journal of Information Technology and Computer Science*, 5(1), 77. <https://doi.org/10.25126/jtiik.201851610>.
- [7] Ramadan, P. S. (2019). Application of Comparison of Bayes' Theorem with Euclidean Probability in Dermatic Bacterial Diagnosis. *InfoTekJar (National Journal of Informatics and Network Technology)*, 4(1), 1–7. <https://doi.org/10.30743/infotekjar.v4i1.1579>
- [8] Riandari, F., Hasugian, P. M., & Taufik, I. (2017). Decision Support System Using the TOPSIS Method in selecting Department Heads at the Sumatra II River Regional Office Medan. *Journal Of Informatic Pelita Nusantara*, Vol. 2(1), 6–13.
- [9] R. E. Sorace, V. S. Reinhardt, and S. A. Vaughn, "High-speed digital-to-RF converter," U.S. Patent 5 668 842, Sept. 16, 1997.
- [9] Setiawan, W. (2020). Selection of the Best Teacher, MPE, con Implementation of the Exponential Comparison Method (MPE) in the Selection of the Best Teacher at SMKXYZ. *JATISI (Journal of Informatics Engineering and Information Systems)*, 6(2), 212–228. <https://doi.org/10.35957/jatisi.v6i2.216>
- [10] Muryono, Tupan Tri, Irwansyah Irwansyah, and Agus Budiyantera. "Determination of employee recruitment using exponential comparison method (mpe)." *Infotech: Journal of Technology Information* 6.2 (2020): 57-62.
- [11] Andri Sahata Sitanggang. (2018). Journal, Team Editor. "The design of a decision-making system modeling for the selection of majors uses the exponential comparison method (MPE) of universities in West Java.
- [12] Purwanto, R. (2018). Design a Decision Support System (DSS) to Help Determine the Results of Employee Selection at the Cilacap State Polytechnic Using the Exponential Comparison Method (MPE). *Journal of Informatics: Journal of IT Development*, 3(2), 190-199.