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Implementation of the Exponential Comparison Method (MPE) in a Decision Support System for Selecting the Chairperson of PORSENI 2.0 at the BEM of STMIK Mardira Indonesia

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ABSTRACT

The selection of the chairperson for PORSENI 2.0 at BEM STMIK Mardira Indonesia is a strategic process that determines event quality and success. Current selection mechanisms rely on subjective considerations, producing unmeasurable and potentially biased results. This study applies the Exponential Comparison Method (MPE) to evaluate candidates objectively based on five criteria : Conflict Level, Leadership, Problem Solving, Human Resource Management, and Integrity. Four candidates were evaluated : Dylan Hafizh, Rangga Putra, Harry Ramdani, and Selva Ananda. Results showed that Rangga Putra achieved the highest total score of 7001, demonstrating superior performance across all criteria. This research confirms that MPE provides a structured and accountable decision support tool for transparent and measurable leadership selection.

Keywords: Decision Support System; MPE; Leadership Selection; Porseni 2.0

ABSTRAK

Pemilihan ketua pelaksana PORSENI 2.0 di BEM STMIK Mardira Indonesia merupakan proses strategis yang menentukan kualitas dan kesuksesan acara. Mekanisme pemilihan saat ini mengandalkan pertimbangan subjektif yang menghasilkan keputusan tidak terukur dan berpotensi bias. Penelitian ini menerapkan Metode Perbandingan Eksponensial (MPE) untuk mengevaluasi kandidat secara objektif berdasarkan lima kriteria : Tingkat Konflik, Kepemimpinan, Pemecahan Masalah, Manajemen SDM, dan Integritas. Empat kandidat dievaluasi : Dylan Hafizh, Rangga Putra, Harry Ramdani, dan Selva Ananda. Hasil menunjukkan Rangga Putra mencapai skor tertinggi 7001, menunjukkan kinerja superior di semua kriteria. Penelitian ini mengonfirmasi bahwa MPE menyediakan alat pendukung keputusan yang terstruktur dan akuntabel untuk pemilihan kepemimpinan yang transparan dan terukur.

Kata Kunci: Sistem Pendukung Keputusan, MPE, Ketua Pelaksana, Porseni 2.0.

INTRODUCTION

PORSENI 2.0 is a major event organized by the Student Executive Board (BEM) of STMIK Mardira Indonesia that requires strong leadership to ensure successful execution. The chairperson plays a strategic role in coordinating planning, decision-making, and teamwork. However, current selection processes rely on subjective considerations and informal recommendations, increasing bias and limiting transparency. This highlights the need for a systematic approach to ensure selected candidates possess the required competencies.

A Decision Support System (DSS) offers an appropriate solution. DSS are computer-based information systems designed to assist decision-makers in evaluating multiple criteria systematically and objectively by combining data, analytical models, and user-friendly interfaces (Fernando & Baldelovar, 2023). The Exponential Comparison Method (MPE) is particularly effective, producing clearer rankings by emphasizing criterion value differences through exponential weighting.

Recent research demonstrates the effectiveness of multi-criteria methods in leadership selection. Suryani et al. (2024) developed a DSS for BEM president selection using Multi-Factor Evaluation Process, successfully providing efficient recommendations based on communication skills, leadership, vision, and organizational experience. Nesti et al. (2025) applied AHP and TOPSIS for selecting santri organization leaders, showing that integrated methods effectively handle complex leadership criteria.

Specifically for MPE applications, Pratiwi et al. (2024) validated MPE's effectiveness in scholarship selection for Islamic millennial programs, confirming its capability to handle multiple criteria objectively. Launtu et al. (2023) implemented MPE for banking performance assessment, demonstrating that exponential weighting produces clearer rankings and realistic priority orders. Anggita (2024) applied Simple Additive Weighting for organizational leader selection, achieving 80% accuracy while reducing

subjective bias.

Despite these advances, a research gap exists in applying MPE specifically for event leadership selection in student organizations. Previous studies focused on general organizational leadership (Suryani et al., 2024; Nesti et al., 2025), academic evaluation (Pratiwi et al., 2024), or administrative positions (Launtu et al., 2023). The novelty of this research lies in adapting MPE to student event management contexts, where criteria such as conflict management and human resource coordination under time constraints are critical. MPE's exponential weighting provides distinct performance differentiation necessary for event leadership where small differences significantly impact success.

This study aims to: (1) identify relevant evaluation criteria for event chairperson candidates; (2) implement and test MPE effectiveness in processing multi-criteria assessment data; and (3) provide a replicable framework for other student organizations facing similar leadership selection challenges.

METHODOLOGY

1. Research Approach

This study employs a quantitative approach that integrates literature review, data collection, and mathematical analysis through the Exponential Comparison Method (MPE). A quantitative approach is chosen because it allows the evaluation of candidates to be conducted in a measurable and objective manner, relying on numerical data obtained from questionnaires. The research stages are designed systematically, beginning with problem identification, literature collection, distribution of data collection instruments, and culminating in the analysis and formulation of recommendations for the PORSENI 2.0 chairperson candidates.

2. Research Flow

The research stages are illustrated as follows:

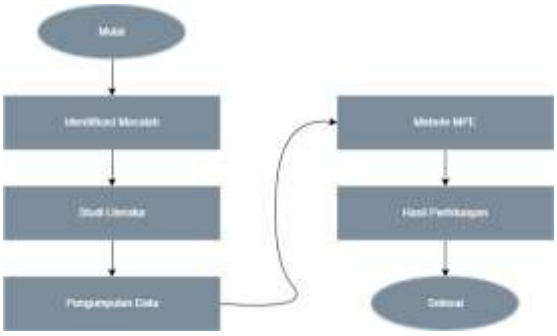

Figure 1.
Research Flow

The research process is illustrated in Figure 1, which presents the workflow from the initial to the final stage. Broadly, this study involves five main stages: problem identification, literature review, data collection, application of the Exponential Comparison Method (MPE), and preparation of results and recommendations. Each stage is designed to be interconnected and to support the achievement of the research objective, namely producing an objective and accountable ranking of the PORSENI 2.0 chairperson candidates.

a. Problem Identification

The initial stage aims to understand issues arising in previous chairperson selection processes. The researcher conducted observations and discussions with BEM members and related parties to identify factors that caused past selections to be less objective. The information obtained serves as the basis for designing a more structured approach to candidate evaluation, as well as establishing relevant assessment criteria.

b. Literature Review

The literature review was conducted to gather information on decision support systems, multi-criteria decision-making methods, and the principles and application of the Exponential Comparison Method. Sources included scientific journals, research articles, and recent reference books. This stage provides the theoretical foundation for the study, assisting the researcher in determining criteria, formulating assessment instruments, and understanding the functioning of MPE to ensure its application aligns with the context of selecting the chairperson.

c. Data Collection

Data were collected through questionnaires distributed to BEM members who are knowledgeable about the performance of chairperson candidates. The questionnaires were designed to assess candidates based on predetermined criteria, such as leadership ability, integrity, human resource management skills, and problem-solving capability. Responses were then coded into numerical data for further processing using MPE. Accurate and representative data are crucial for the success of the analysis; therefore, the questionnaires were carefully designed to ensure respondent validity.

d. Application of the Exponential Comparison Method (MPE)

After data collection, the next step is the application of MPE. This method calculates alternative values based on exponential weighting for each criterion. In simple terms, MPE emphasizes small differences between candidates, producing clearer rankings that reflect actual performance differences. The MPE implementation involves the following steps:

1. Determining the alternatives to be evaluated (chairperson candidates)
2. Establishing evaluation criteria along with their respective weights..
3. Assigning scores to each alternative for each criterion based on questionnaire results.
4. Calculating the exponential values for each alternative.
5. Summing the total scores of each alternative.
6. Compiling the final ranking based on the total scores obtained..

The MPE formula used is:

$$\text{Total Nilai } (TN_i) = \sum_{j=1}^{m} (RK_{ij})^{TKKj}$$

Notes:

1. TNi = total score of the i-th alternative
2. RKij = relative importance level of the j-th criterion for the i-th alternative
3. TKKj = weight of the j-th criterion (TKKj > 0)
4. m = total number of criteria

e. Preparation of Results and Recommendations

The final stage of the research involves analyzing the MPE calculations to obtain the total score for each candidate. These scores are then compared to determine the final ranking, which serves as the basis for recommending the best candidate. The results are expected to provide more objective and accountable decision-making for BEM and serve as a reference for other student organizations that wish to implement a systematic candidate evaluation method.

RESULT AND DISCUSSION

1. Alternative Data for Chairperson Candidates

In this study, the alternatives for the PORSENI 2.0 chairperson were selected from members of the Ministry of Interests and Talents, as PORSENI is a major program under this ministry. Based on initial identification, four candidates were proposed:

Table 1.
Candidate alternatives

Alternative	
Members	Dylan Hafizh
	Rangga Putra
	Harry Ramdani
	Selva Ananda

These four candidates were used as alternatives in the evaluation process using the Exponential Comparison Method (MPE), allowing assessments to be conducted objectively and measurably. Each candidate was evaluated according to criteria relevant to leadership requirements for organizing PORSENI 2.0, ensuring that the calculations reflect the candidates' actual performance.

2. Determination of Chairperson Evaluation Criteria

The next step was to establish the evaluation criteria used as the basis for assessment. The criteria were determined through interviews with the BEM Chairperson to ensure each criterion was relevant and aligned with the leadership requirements of PORSENI 2.0. Five main criteria were used in this study:

Table 2.
Main Criteria

Criteria	Attribute	Decision Criteria (Alternative Evaluation)	Scale Conversion
Conflict Level	Cost	Very Poor	1
Leadership	Benefit	Poor	2
Problem Solving	Benefit	Fair	3
Human Resource Management	Benefit	Good	4
Integrity	Benefit	Very Good	5

Benefit criteria indicate that higher values reflect better performance, while cost criteria indicate that lower values are preferable. For example, Conflict Level is categorized as a cost criterion, as lower conflict is better in a leadership context.

Each criterion was also assessed using a numerical conversion scale from 1 to 5, transforming descriptive ratings from "Very Poor" to "Very Good" into numerical values suitable for MPE calculation. Specifically, Conflict Level was rated from "None," "Low," "Moderate," "High," to "Very High," where "None" represents the best condition. This numerical conversion allows the data to be processed mathematically, producing an objective ranking.

Table 3.
Value Range Per Criterion

Criteria	Value Range	Numeric Conversion
Conflict Level	None	5
	Low	4
	Modrate	3
	High	2
	Very High	1
Leadership	Very Poor	1
	Poor	2
	Fair	3
	Good	4
	Very Good	5
Problem Solving	Very Poor	1
	Poor	2

	Fair	3
	Good	4
	Very Good	5
Human Resource Management	Very Poor	1
	Poor	2
	Fair	3
	Good	4
	Very Good	5
Integrity	Very Poor	1
	Poor	2
	Fair	3
	Good	4
	Very Good	5

3. Determination of Criterion Importance

Each criterion was assigned an importance weight through interviews with the BEM Chairperson. These weights indicate how significant each criterion is in evaluating the chairperson candidates. The weights were assigned on a scale of 1 to 5, ranging from "Not Important" to "Very Important.".

Table 4.
Criterion Importance Levels

Criteria	Importance Level	Weight Value	Conversion Scale	
Conflict Level	Fairly Important	3	Not Important	1
Leadership	Very Important	5	Slightly Important	2
Problem Solving	Fairly Important	3	Fairly Important	3
Human Resource Management	Important	4	Important	4
Integrity	Very Important	5	Very Important	5

The interview results showed that Leadership and Integrity were the most important criteria, as these factors strongly determine a chairperson's ability to manage the committee and ensure smooth operations. Problem Solving and Conflict Level were categorized as fairly important, while Human Resource Management was considered important. These weight values were then used in the exponential calculation to determine the total scores of each alternative.

4. Data Collection and Alternative Assessment

Data for evaluation were collected through questionnaires filled out by active BEM members. Respondents rated each candidate based on the five predetermined criteria. The scoring scale ranged from 1 to 5, where 1 indicated the poorest condition or highest conflict, and 5 indicated the best condition or minimal conflict. The average scores for each candidate were converted into numerical data for use in MPE calculations..

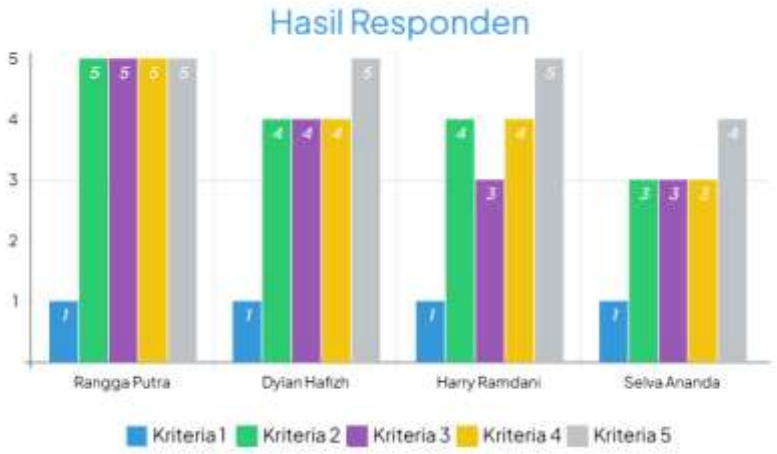

Figure 2.
Questionnaire Response Results

The candidate scores were as follows:

1. **Dylan Hafizh**: Conflict Level 1, Leadership 4, Problem Solving 4, HR Management 4, Integrity 5.
2. **Rangga Putra**: Conflict Level 1, Leadership 5, Problem Solving 5, HR Management 5, Integrity 5.
3. **Harry Ramdani**: Conflict Level 1, Leadership 4, Problem Solving 3, HR Management 4, Integrity 5.
4. **Selva Ananda**: Conflict Level 1, Leadership 3, Problem Solving 3, HR Management 3, Integrity 4.

These data were then summarized in a comprehensive table linking each alternative with the score for each criterion and its numerical conversion, facilitating the MPE calculation..

Table 5.
Comprehensive Evaluation Table

Alternative	Criterion	Value	Numeric Conversion
Dylan Hafizh	Conflict Level	None	1
	Leadership	Good	4
	Problem Solving	Good	4
	Human Resource Management	Good	4
	Integrity	Very Good	5
Rangga Putra	Conflict Level	None	1
	Leadership	Very Good	5
	Problem Solving	Very Good	5
	Human Resource Management	Very Good	5
	Integrity	Very Good	5
Harry Ramdani	Conflict Level	None	1
	Leadership	Good	4
	Problem Solving	Fair	3
	Human Resource Management	Good	4

	Integrity	Very Good	5
Selva Ananda	Conflict Level	None	1
	Leadership	Fair	3
	Problem Solving	Fair	3
	Human Resource Management	Fair	3
	Integrity	Good	4

5. Calculation of Total Scores (TN) Using MP

After collecting all numerical data, the total score (TN) for each candidate was calculated using the Exponential Comparison Method. In this method, each criterion's score is raised to the power of its importance weight, giving greater influence to criteria with higher weights. The MPE formula is:

$$\text{Total Nilai } (TN_i) = \sum_{j=1}^{m} (RK_{ij})^{TKKj}$$

DiWhere TNi is the total score of the i-th alternative, RKij is the score of the i-th alternative on the j-th criterion, TKKj is the weight of the j-th criterion, and m is the total number of criteria.

The TN calculations for each candidate were as follows:

1. $TN1 = 1^3 + 4^5 + 4^3 + 4^4 + 5^5$

   $= 1 + 1024 + 64 + 256 + 3125 = 4470$

2. $TN2 = 1^3 + 5^5 + 5^3 + 5^4 + 5^5$

   $= 1 + 3125 + 125 + 625 + 3125 = 7001$

3. $TN3 = 1^3 + 4^5 + 3^3 + 4^4 + 5^5$

   $= 1 + 1024 + 27 + 256 + 3125 = 4433$

4. $TN4 = 1^3 + 3^5 + 3^3 + 3^4 + 4^5$

   $= 1 + 243 + 27 + 81 + 1024 = 1376$

6. Ranking Analysis

Based on the total scores, the candidates were ranked from highest to lowest:

Table 6.
Candidate Rankings

Calculating the Total TN for Each Alternative							Rank
TN1	1	1024	64	256	3125	4470	2
TN2	1	3125	125	625	3125	7001	1
TN3	1	1024	27	256	3125	4433	3
TN4	1	243	27	81	1024	1376	4

This ranking indicates that Rangga Putra (TN2) has the best overall performance based on the five evaluation criteria. The higher total score reflects superior Leadership, Integrity, Problem Solving, and Human Resource Management skills, while maintaining minimal conflict levels compared to the other candidates.

CONCLUSIONS AND SUGGESTIONS

Based on the results of this study, it can be concluded that the application of the Exponential Comparison Method (MPE) in selecting the chairperson of PORSENI 2.0 contributes significantly to the objectivity and transparency of the evaluation process. Through systematic data processing, this study successfully identified the main criteria relevant to determining a candidate's suitability, namely Conflict Level, Leadership, Problem Solving, Human Resource Management, and Integrity. Each criterion was assigned a weight according to its level of importance, ensuring that the results were not solely based on subjective opinions but on measurable evaluations from competent respondents.

The MPE calculation results demonstrate that differences between candidates are clearly distinguished, as the exponentiation of scores according to criterion weights emphasizes significant differences. Among the four evaluated candidates, Rangga Putra achieved the highest total score, indicating that he possesses the optimal combination of leadership ability, integrity, human resource management skills, and problem-solving capability for the successful organization of PORSENI 2.0.

Furthermore, this study confirms that MPE can serve as a structured and accountable decision-support tool. This method not only facilitates candidate ranking but also provides an objective basis for BEM to make recommendations for the chairperson position. As such, this approach can serve as a model for other student organizations seeking to implement data-driven evaluation systems, allowing leadership selection to be conducted fairly, transparently, and professionally.

Overall, this research demonstrates the effectiveness of MPE in enhancing decision-making quality in the context of large-scale leadership activities. The study also provides theoretical and practical implications, highlighting the potential for further research to refine multi-criteria evaluation methods in organizational and leadership selection contexts. Future studies may explore additional criteria, alternative weighting approaches, or the integration of MPE with other decision-support methods to further improve objectivity and accuracy in candidate evaluation.

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