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Implementation of the Objective Weighting and Grey Relational Analysis Method for the Promotion of the Position of Chief Financial Officer

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Abstract: The promotion of the Chief Financial Officer (CFO) position is a form of appreciation for performance, competence, and significant contribution to the organization's financial management. This promotion is expected to motivate individuals to continue to improve their professional competence and have a greater positive impact on the development of the organization in the future. Problems in the promotion of the CFO position often arise due to various factors, both from the internal side of the organization and individuals. One of the main problems is the lack of transparency in the performance appraisal process, where the criteria for promotion are not clear or not in accordance with the standards that have been set. Subjective factors in job appraisals can trigger employee dissatisfaction, especially if the decisions taken are more influenced by personal proximity than competence and achievements. This study aims to implement an objective and accurate decision support system in the promotion process for the position of CFO by applying the GRA method and objective weighting using the CRITIC method. The ranking results show the ranking of candidates in the promotion of the Chief Financial Officer position based on their respective evaluation scores. Candidate 7 took first place with the highest score of 0.1251, followed by Candidate 6 with a score of 0.1242, and candidate 4 was in third place with a score of 0.1101. This shows that Candidates 7 and 6 have a significant competitive advantage over other candidates for the position. Contribution to the promotion of the CFO position is crucial in ensuring that decisions made in the assessment of candidates are not only based on intuition or subjective considerations, but through a systematic, objective, and data-driven approach.
Keywords: CRITIC Method; GRA Method; Objective Weighting; Performance; Promotion;

1. INTRODUCING

The position of Chief Financial Officer (CFO) is a strategic position in an organization that is responsible for planning, managing, and controlling all aspects of the company's or institution's finances[1]. Its main duties include preparing budgets, monitoring cash flows, analyzing financial performance, and ensuring compliance with applicable accounting standards and regulations. CFO must be able to provide accurate and timely financial reports as the basis for managerial decision-making, as well as design effective financial strategies to improve operational efficiency and long-term financial stability. With competence in data analysis and a deep understanding of risk management, this role is crucial in supporting the success and sustainability of the organization[2]. The promotion of the position of Head of Finance is a form of appreciation for performance, competence, and significant contribution to the organization's financial management. The promotion process is usually based on a thorough

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evaluation of the achievement of financial targets, the ability to develop and implement effective financial strategies, and its success in ensuring budget efficiency and cash flow stability. In addition, aspects of leadership, managerial ability, and initiative in financial innovation are decisive factors in assessing the readiness of a Head of Finance to occupy a higher position. This promotion is expected to motivate individuals to continue to improve their professional competence and have a greater positive impact on the development of the organization in the future. Problems in the promotion of the position of Head of Finance often arise due to various factors, both from the internal side of the organization and individuals. One of the main problems is the lack of transparency in the performance appraisal process, where the promotion criteria are not clear or not in accordance with the standards that have been set. In addition, conflicts of interest and the presence of subjective factors in appraisals can trigger dissatisfaction among employees, especially if decisions are influenced more by personal proximity than competence and achievement. If these issues are not addressed properly, they can demotivate employees, create an unhealthy work environment, and hinder the overall growth of the organization[3].

Overcoming problems in the promotion of the position of Chief Financial Officer can be done through the Decision Support System (DSS) approach[4], [5]. DSS allows the decision-making process to be more objective, transparent, and structured by utilizing multi-criteria-based methods[6]–[8]. With this DSS approach, the process of promoting the position of Chief Financial Officer will be more structured, objective, and accountable, so that it can overcome various problems such as subjectivity, lack of transparency, and conflict of interest. The implementation of this system also helps create fairness in assessments and increases employee motivation to continue to excel. One of the methods in DSS is gray relational analysis (GRA). GRA is one of the methods in gray system theory used to solve multi-criteria decision-making problems with uncertain, limited, or incomplete data. The GRA method has advantages in its flexibility and ability to handle incomplete or dynamic data[9]–[11]. One of the main drawbacks of GRA lies in the handling of criteria weights that are not explicit in its standard methods. The GRA assumes by default that all criteria have the same level of importance, so it does not take into account the difference in weights between criteria that may have a significant influence on decision-making. Therefore, the GRA method is often combined with objective weighting techniques to increase the level of accuracy in supporting the decision-making process.

The objective weighting method is an approach that utilizes mathematical analysis of data to determine the weight or level of importance of each criterion in the decision-making process, without involving the subjective preferences of decision-makers[12], [13]. This approach aims to ensure more objective, consistent, and free results from individual bias. This method is particularly useful in situations where subjective preferences are difficult to determine or unreliable, allowing for more transparent and accurate evaluations. One of the objective weighting methods is criteria importance through intercriteria correlation (CRITIC). The CRITIC method is one of the objective weighting techniques that aims to determine the weight of criteria based on data variation and the relationship between criteria. This method is oriented towards the analysis of available data without considering subjective preferences, CRITIC is becoming one of the popular weighting methods for producing transparent, fact-based decisions[14]–[16]. The advantage of the CRITIC method is its ability to combine statistical information with the relationship between criteria, so that it is able to produce a more objective and valid weight. This method is often used in various fields in the selection of the best alternative, and other multi-criteria assessments, as it ensures that the criteria that have more information and relevance gain greater weight.

The combination approach of GRA and CRITIC integrates two methods to improve accuracy and objectivity in multi-criteria decision-making. In this approach, CRITIC plays a role in determining the objective weight of each criterion by considering the variability of the data and the linkage between the criteria, while the GRA is used to analyze and rank alternatives based on their proximity to the ideal solution. The process begins with the weighting of the criteria using CRITIC, which takes into account the correlation between the criteria and the standard deviation value to identify the importance of each criterion. These weights are then applied in the GRA method to calculate the value of each alternative, resulting in a rating that objectively reflects the optimal solution. This approach is effective in reducing

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subjective bias, improving the accuracy of analysis, and providing more transparent and relevant results for various areas, such as performance evaluation, strategy selection, and project assessment.

Research on position promotion is carried out by [17] in this system using the profile matching method which is an approach that compares the candidate's competency profile or qualifications with the standards or criteria that have been set for a certain position. With this method, the system can analyze the extent to which candidates meet the requirements, helping the selection process to be more objective, efficient, and accurate. Research from [18] with the implementation of a decision support system using the Analytical Hierarchy Process (AHP) method, a hierarchical-based decision-making technique that breaks down complex problems into several levels of criteria and sub-criteria. This method allows for more systematic and measurable decision-making by comparing different alternative promotion strategies based on priorities resulting from the weighting process and evaluation consistency. Research from [19] the development of a decision support system designed to assist the process of promotion using the Fuzzy Umano approach, which is a fuzzy logic-based method that aims to handle uncertainty or subjectivity in assessment data. The end result is a more objective and accurate recommendation, in accordance with the standards that have been set. The difference from the research conducted using the objective weighting method, namely CRITIC, to determine the weight of the criteria quantitatively, combined with the GRA to systematically determine alternative rankings.

This research aims to implement an objective and accurate decision support system in the promotion process of the Chief Financial position by implementing the GRA method and objective weighting. By combining these two approaches, this study seeks to comprehensively evaluate the candidate's performance based on relevant criteria, such as managerial ability, financial competence, strategic analysis ability, and leadership. The results of this study are expected to help organizations in making more transparent, fair, and data-driven promotion decisions, as well as increase accuracy in selecting the most deserving candidates to occupy these strategic positions.

2. RESEARCH METHODOLOGY

The research stage is a series of systematic steps designed to answer a research question or solve a problem scientifically. This stage aims to ensure that the research process takes place in a structured, valid, and accountable manner. With an organized approach, each step is designed to support the achievement of research objectives in a logical and systematic manner. In addition, the research stage allows researchers to evaluate the validity of the data, the accuracy of the method, and the relevance of the results to the problems raised. Not only as a guideline for implementation, this stage is also an important tool to maintain the quality and credibility of research. An illustration of the stages is shown in figure 1.

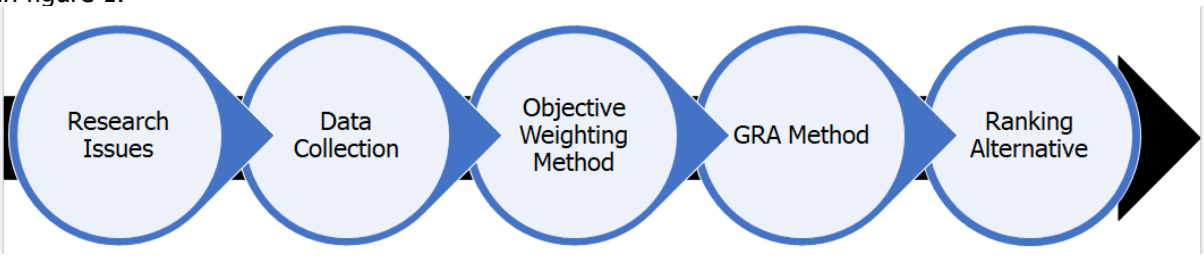

Figure 1. Research Stages

The problem in the promotion of the CFO position is often related to determining the best candidates who not only meet the technical qualifications, but also have the strategic and leadership abilities necessary to face the complex challenges in finance. The selection process often faces subjectivity constraints, a lack of transparency, and difficulties in objectively comparing candidates based on important criteria such as risk management, strategic decision-making, integrity, and financial competence. Therefore, a data-driven approach that uses analytical methods and objective weighting is needed to ensure that promotions are carried out fairly and transparently, while supporting accurate decision-making.

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Data collection in the promotion of CFO positions is carried out to obtain objective and comprehensive information about the candidates assessed. Data was obtained from a variety of sources, including performance evaluation results, managerial reports, work experience records, and interviews with panel judges. This assessment includes several key criteria, such as managerial ability, competence in financial analysis, strategic decision-making, integrity, and innovation in risk management. In addition, quantitative data, such as the achievement of financial targets and success in the implementation of financial strategies, can also be used.

The objective weighting method using CRITIC aims to determine the weight of each criterion based on the objective information contained in the analyzed data. The CRITIC method ensures that the weights reflect the actual information from the data without any subjective bias, thus supporting fairer and more reliable analysis in the decision-making process. Using the CRITIC method, each criterion derives a weight that reflects the level of its contribution to the overall complexity of the evaluation system. This method supports a more objective, transparent, and data-driven selection process, so that promotion decisions can be made fairly and accountable.

The GRA method is a multi-criteria decision-making technique that aims to evaluate and rank alternatives based on their proximity or relationship to the ideal solution. The application of GRA in CFO promotions allows for an objective assessment of candidates based on a variety of important criteria. The ranking results generated by the GRA provide a solid basis for decision-makers to select the best candidates, reduce subjectivity bias, and ensure that the promotion process is carried out transparently and based on relevant data.

Alternative ranking is the final stage in the multi-criteria decision-making process, where the aggregate value of each alternative is calculated and sorted to determine the order of preferences based on their performance against the predetermined criteria. In the promotion of the CFO position, this ranking is obtained by combining the evaluation value of each candidate on all criteria. The candidate with the highest score is considered the best choice because it has the greatest fit with the ideal profile that has been set. These ratings not only provide transparent and measurable end results, but also support more fair and objective decision-making, as they are based on systematic data and analysis.

2.1. CRITIC Weighting Method

The CRITIC method is an objective weighting technique that aims to determine the level of importance of criteria in a decision-making process based on two main elements, namely data variability and the relationship between criteria[20], [21]. This method is used to ensure that the criterion weights reflect the objective information contained in the available data. The CRITIC method ensures that criteria with more significant information and less overlap with other criteria gain more weight, resulting in fairer and data-driven decisions.

The first step is that the decision matrix is a tabular representation of alternatives and criteria in a multi-criteria decision-making process. This matrix is used as a basis for evaluating and analyzing alternatives based on the values of relevant criteria. The formula of the decision matrix is made with the following equation.

$$X = \begin{bmatrix} x_{11} & \cdots & x_{1n} \\ \vdots & \ddots & \vdots \\ x_{m1} & \cdots & x_{mn} \end{bmatrix} \quad (1)$$

The second step is to normalize the data to equalize the scale of all criteria so that they can be compared directly. The normalization formula is calculated by the following equation.

$$d_{ij} = \frac{x_{ij} - \min x_{ij}}{\max x_{ij} - \min x_{ij}} \quad (2)$$

The third step is to calculate the standard deviation for each criterion to measure the degree of variation or spread of data on each criterion. The standard deviation formula is calculated by the following equation.

$$\sigma_j = \sqrt{\frac{\sum_{i=1}^{n} (d_{ij} - \bar{d}_j)^2}{n}} \quad (3)$$

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The fourth step is to calculate the correlation between the criteria using the Pearson correlation matrix to assess the relationship between the two criteria. The correlation formula between the criteria is calculated by the following equation.

$$R_{ij} = \frac{\sum_{i=1}^{n}(a_{ij}-\bar{a}_j)*(a_{ij}-\bar{a}_h)}{\sqrt{\sum_{i=1}^{n}(a_{ij}-\bar{a}_j)^2}*\sqrt{\sum_{i=1}^{n}(a_{ij}-\bar{a}_h)^2}} \quad (4)$$

The fifth step is that the value of the information for each criterion is calculated by combining the standard deviation and the relationship between the criteria. The formula for the value of information is calculated by the following equation.

$$C_j = \sigma_j \sum_{j=1}^{n}(1 - R_{ij}) \quad (5)$$

The sixth step is to calculate the weight of the criteria by normalizing the value of the information to get an objective weight. The criterion weight formula is calculated by the following equation.

$$W_j = \frac{C_j}{\sum C_j} \quad (6)$$

Criterion weights describe the relative importance of each criterion objectively, which is based on data variation and correlation. The CRITIC method generates fair and data-driven weighting, ensuring objective and reliable decision-making.

2.2. Grey Relational Analysis Method

Grey Relational Analysis (GRA) is an analysis method used to evaluate and compare alternatives based on several criteria in multi-criteria decision-making[22], [23]. GRA is widely used for situations involving incomplete or uncertain data (gray), where the information is not fully known or clearly defined. This method measures the proximity between alternatives and ideal solutions, so it can be helpful in ranking existing alternatives.

The first step is that the decision matrix is a tabular representation of alternatives and criteria in a multi-criteria decision-making process. This matrix is used as a basis for evaluating and analyzing alternatives based on the values of relevant criteria. The decision matrix formula is made with equation (1).

The second step is to normalize the data to equalize the scale of all criteria so that they can be compared directly. The normalization formula is calculated by the following equation.

$$X_{norm} = \frac{X_{ij}-X_{min}}{X_{max}-X_{min}} \quad (7)$$

The third step is the multiplication of the weights that multiply the values present in the decision matrix by the weights relevant to each criterion. This results in a weighted decision matrix. The formula for weight multiplication is calculated by the following equation.

$$V_{ij} = x_{i,j}.w_j \quad (8)$$

The fourth step is gray relational grade is an overall measurement of the proximity of an alternative to an ideal reference. This value is calculated by averaging the relational coefficients for each alternative across all criteria. The formula for gray relational grade is calculated by the following equation.

$$GRG_i = \frac{1}{n}\sum_{j=1}^{n} V_{ij} \quad (9)$$

The alternative with the highest gray relational grade value is considered the best alternative, because it has the highest proximity to the ideal solution. The GRA method is often used in decision-making that involves evaluating many alternatives with different criteria.

3. RESULT AND DISCUSSIONS

The implementation of objective weighting and the GRA method in the CFO promotion process is a decision that must consider various important criteria, such as financial performance, leadership, managerial ability, and experience. Therefore, this study uses GRA to evaluate alternative CFO candidates based on their proximity to the ideal solution, while the Objective Weighting method uses

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CRITIC, used to objectively set the weight of the criteria, avoiding subjective bias in the assessment. Through the application of these methods, it is hoped that it can provide a more systematic, transparent, and objective approach in selecting CFO candidates who meet the best criteria to advance the company.

3.1. Data Collection

Data collection in the CFO Promotion research was carried out to obtain relevant information about prospective candidates who are considered to fill the position. The data collected includes various criteria that are considered important in the evaluation of CFO candidates, such as financial performance, managerial ability, work experience, leadership, and strategic competence. Data sources can come from a variety of methods, such as annual performance appraisals, direct supervisor evaluations, interview results, and staff or colleague satisfaction surveys. In addition, data can be obtained from the company's internal documents such as financial statements, employee development reports, and achievement records. The data collection process aims to ensure that the information obtained is accurate, complete, and reliable to support objective decision-making in the promotion of the CFO position.

Table 1. Candidate Assessment Data

Candidate Name	Financial Performance	Managerial Skills	Work Experience	Leadership	Strategic Competencies
Candidate 1	8	7	9	8	7
Candidate 2	7	9	8	8	8
Candidate 3	9	8	7	9	8
Candidate 4	8	7	9	7	9
Candidate 5	7	8	8	8	7
Candidate 6	9	9	7	9	8
Candidate 7	8	7	9	8	9

All data collected must be carefully processed to fairly reflect each candidate's ability to meet the requirements for the CFO position, taking into account the company's long-term strategy and goals. Thus, this data collection is crucial to produce appropriate and evidence-based promotional decisions.

Data sources for the assessment of CFO promotions are obtained from various aspects to ensure valid and objective results. The company's internal data is the main reference, including individual performance reports that include the achievement of financial targets, budget efficiency, and contribution to the company's profitability. In addition, assessment reports involving input from superiors and peers are used to evaluate the candidate's leadership, managerial, and interpersonal abilities. The results of the competency assessment are also an important source, such as through the assessment center which includes work simulations, case studies, and psychometric tests to evaluate strategic, analytical, and problem-solving skills. All of these data sources are combined to ensure that the CFO promotion selection process is transparent and objective.

3.2. Determining the Weight of Criteria in the Promotion of the Position of Chief Financial Officer Using the CRITIC Method

Determining the weight of criteria in the promotion of CFO positions using the CRITIC method is a crucial step to assess the contribution of each criterion to the final decision. The CRITIC method measures the importance of each criterion based on two main factors, namely the variation of the criterion data and the correlation between the criteria. Here are the steps of the CRITIC method in determining the weight of the criteria.

The first step is that the decision matrix is a tabular representation of alternatives and criteria in a multi-criteria decision-making process. This matrix is used as a basis for evaluating and analyzing alternatives based on the values of relevant criteria. The formula of the decision matrix is made with the using equation (1).

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$$X = \begin{bmatrix} 8 & 7 & 9 & 8 & 7 \\ 7 & 9 & 8 & 8 & 8 \\ 9 & 8 & 7 & 9 & 8 \\ 8 & 7 & 9 & 7 & 9 \\ 7 & 8 & 8 & 8 & 7 \\ 9 & 9 & 7 & 9 & 8 \\ 8 & 7 & 9 & 8 & 9 \end{bmatrix}$$

The second step is to normalize the data to equalize the scale of all criteria so that they can be compared directly. The normalization formula is calculated by the using equation (2).

$$d_{11} = \frac{x_{11} - \min x_{11,17}}{\max x_{11,17} - \min x_{11,17}} = \frac{8-7}{9-7} = \frac{1}{2} = 0.5$$

Table 2 shows the results of the calculation of the overall normalization value calculated using equation (1), with the data displayed as follows.

Table 2. Normalization Value of the CRITIC Method

Candidate Name	Financial Performance	Managerial Skills	Work Experience	Leadership	Strategic Competencies
Candidate 1	0.5	0	1	0.5	0
Candidate 2	0	1	0.5	0.5	0.5
Candidate 3	1	0.5	0	1	0.5
Candidate 4	0.5	0	1	0	1
Candidate 5	0	0.5	0.5	0.5	0
Candidate 6	1	1	0	1	0.5
Candidate 7	0.5	0	1	0.5	1

The third step is to calculate the standard deviation for each criterion to find out the degree of variation or dispersion of the criteria data. The standard deviation formula is calculated using equation (3).

$$\sigma_1 = \sqrt{\frac{\sum_{i=1}^{n}(d_{11,17} - \bar{d}_1)^2}{7}} = \sqrt{\frac{0+0.25+0.25+0+0.25+0.25+0}{7}} = 0.3780$$

$$\sigma_2 = \sqrt{\frac{\sum_{i=1}^{n}(d_{21,27} - \bar{d}_1)^2}{7}} = \sqrt{\frac{0.1837+0.3265+0.0051+0.1837+0.0051+0.3265+0.1837}{7}} = 0.4165$$

$$\sigma_3 = \sqrt{\frac{\sum_{i=1}^{n}(d_{31,37} - \bar{d}_3)^2}{7}} = \sqrt{\frac{0.1837+0.0051+0.3265+0.1837+0.0051+0.3265+0.1837}{7}} = 0.4165$$

$$\sigma_4 = \sqrt{\frac{\sum_{i=1}^{n}(d_{41,47} - \bar{d}_4)^2}{7}} = \sqrt{\frac{0.0051+0.0051+0.1837+0.3265+0.0051+0.1837+0.0051}{7}} = 0.3194$$

$$\sigma_5 = \sqrt{\frac{\sum_{i=1}^{n}(d_{51,57} - \bar{d}_5)^2}{7}} = \sqrt{\frac{0.25+0+0+0.25+0.25+0+0.25}{7}} = 0.3780$$

The fourth step is to calculate the correlation between the criteria by using the Pearson correlation matrix to evaluate the relationship between these criteria. The correlation formula between the criteria is calculated using equation (4), and the results of the calculation are presented in Table 3.

Table 3. Correlation Between the Criteria of the CRITIC Method

Criteria	Financial Performance	Managerial Skills	Work Experience	Leadership	Strategic Competencies
Financial Performance	0.000	1.000	1.454	0.408	0.750

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Criteria	Financial Performance	Managerial Skills	Work Experience	Leadership	Strategic Competencies
Managerial Skills	1.000	0.000	1.794	0.425	1.227
Work Experience	1.454	1.794	0.000	1.844	0.773
Leadership	0.408	0.425	1.844	0.000	1.296
Strategic Competencies	0.750	1.227	0.773	1.296	0.000

The fifth step is to calculate the value of the information for each criterion by combining the standard deviations and the relationships between the criteria. The formula for calculating the value of this information uses equation (5).

$$C_1 = \sigma_1 \sum_{j=1}^{n} \left(1 - R_{11,15}\right) = 0.3780 * 3.6121 = 1.3653$$

$$C_2 = \sigma_2 \sum_{j=1}^{n} \left(1 - R_{21,25}\right) = 0.4165 * 4.4458 = 1.8516$$

$$C_3 = \sigma_3 \sum_{j=1}^{n} \left(1 - R_{31,35}\right) = 0.4165 * 5.8647 = 2.4426$$

$$C_4 = \sigma_4 \sum_{j=1}^{n} \left(1 - R_{41,45}\right) = 0.3194 * 3.9726 = 1.2690$$

$$C_5 = \sigma_5 \sum_{j=1}^{n} \left(1 - R_{51,55}\right) = 0.3780 * 4.0458 = 1.5292$$

The sixth step is to calculate the weight of the criteria by normalizing the value of the information to obtain an objective weight. The formula for calculating the weight of this criterion uses equation (6).

$$W_1 = \frac{C_1}{\sum C_{1,5}} = \frac{1.3653}{1.3653 + 1.8516 + 2.4426 + 1.2690 + 1.5292} = \frac{1.3653}{8.4577} = 0.1614$$

$$W_2 = \frac{C_2}{\sum C_{1,5}} = \frac{1.8516}{1.3653 + 1.8516 + 2.4426 + 1.2690 + 1.5292} = \frac{1.8516}{8.4577} = 0.2189$$

$$W_3 = \frac{C_3}{\sum C_{1,5}} = \frac{2.4426}{1.3653 + 1.8516 + 2.4426 + 1.2690 + 1.5292} = \frac{2.4426}{8.4577} = 0.2888$$

$$W_4 = \frac{C_4}{\sum C_{1,5}} = \frac{1.2690}{1.3653 + 1.8516 + 2.4426 + 1.2690 + 1.5292} = \frac{1.2690}{8.4577} = 0.15$$

$$W_5 = \frac{C_5}{\sum C_{1,5}} = \frac{1.5292}{1.3653 + 1.8516 + 2.4426 + 1.2690 + 1.5292} = \frac{1.5292}{8.4577} = 0.1808$$

The results of the criteria weights have been obtained based on the calculation of each stage in the CRITIC method, the results of this weight are objective based on the existing assessment data.

3.3. Assessment of Candidates in the Promotion of the Position of Chief Financial Officer Using the GRA Method

The assessment of candidates in the promotion of CFO positions using the GRA method involves evaluating several important criteria, such as financial performance, managerial ability, work experience, leadership, and strategic competence. The GRA is used to measure the proximity between existing values and the ideal solution, where the candidate closest to the ideal solution is considered the best

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choice for the position. The following are the stages in the application of the GRA method for candidate assessment:

The first step is that the decision matrix is a tabular representation of alternatives and criteria in a multi-criteria decision-making process. This matrix is used as a basis for evaluating and analyzing alternatives based on the values of relevant criteria. The decision matrix formula is made with equation (1).

$$X = \begin{bmatrix} 8 & 7 & 9 & 8 & 7 \\ 7 & 9 & 8 & 8 & 8 \\ 9 & 8 & 7 & 9 & 8 \\ 8 & 7 & 9 & 7 & 9 \\ 7 & 8 & 8 & 8 & 7 \\ 9 & 9 & 7 & 9 & 8 \\ 8 & 7 & 9 & 8 & 9 \end{bmatrix}$$

The second step is to normalize the data to equalize the scale of all criteria so that they can be compared directly. The normalization formula is calculated by the using equation (7).

$$x_{norm11} = \frac{x_{11} - \min x_{11,17}}{\max x_{11,17} - \min x_{11,17}} = \frac{8-7}{9-7} = \frac{1}{2} = 0.5$$

Table 4 is the overall result of the calculation of the normalization value calculated using equation (7), the data is displayed as follows.

Table 4. Normalization Value of the GRA Method

Candidate Name	Financial Performance	Managerial Skills	Work Experience	Leadership	Strategic Competencies
Candidate 1	0.5	0	1	0.5	0
Candidate 2	0	1	0.5	0.5	0.5
Candidate 3	1	0.5	0	1	0.5
Candidate 4	0.5	0	1	0	1
Candidate 5	0	0.5	0.5	0.5	0
Candidate 6	1	1	0	1	0.5
Candidate 7	0.5	0	1	0.5	1

The third step is the multiplication of the weights that multiply the values present in the decision matrix by the weights relevant to each criterion. This results in a weighted decision matrix. The formula for weight multiplication is calculated by the using equation (8).

$$V_{11} = x_{norm11} * w_1 = 0.5 * 0.1614 = 0.0807$$

Table 5 is the overall result of the calculation of the multiplication of the weights calculated using equation (8), the data is displayed as follows.

Table 4. Multiplication Weights of the GRA Method

Candidate Name	Financial Performance	Managerial Skills	Work Experience	Leadership	Strategic Competencies
Candidate 1	0.0807	0.0000	0.2888	0.0750	0.0000
Candidate 2	0.0000	0.2189	0.1444	0.0750	0.0904
Candidate 3	0.1614	0.1095	0.0000	0.1500	0.0904
Candidate 4	0.0807	0.0000	0.2888	0.0000	0.1808
Candidate 5	0.0000	0.1095	0.1444	0.0750	0.0000
Candidate 6	0.1614	0.2189	0.0000	0.1500	0.0904
Candidate 7	0.0807	0.0000	0.2888	0.0750	0.1808

The fourth step is gray relational grade is an overall measurement of the proximity of an alternative to an ideal reference. This value is calculated by averaging the relational coefficients for each

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alternative across all criteria. The formula for gray relational grade is calculated by the using equation (9).

$$GRG_{Candidate\ 1} = \frac{1}{5}\sum_{j=1}^{n} V_{11,51} = \frac{1}{5} * (0.0807 + 0.0000 + 0.2888 + 0.0750 + 0.0000) = 0.0899$$

$$GRG_{Candidate\ 2} = \frac{1}{5}\sum_{j=1}^{n} V_{12,52} = \frac{1}{5} * (0.0000 + 0.2189 + 0.1444 + 0.0750 + 0.0904) = 0.1058$$

$$GRG_{Candidate\ 3} = \frac{1}{5}\sum_{j=1}^{n} V_{13,53} = \frac{1}{5} * (0.1614 + 0.1095 + 0.0000 + 0.1500 + 0.0904) = 0.1023$$

$$GRG_{Candidate\ 4} = \frac{1}{5}\sum_{j=1}^{n} V_{14,54} = \frac{1}{5} * (0.0807 + 0.0000 + 0.2888 + 0.0000 + 0.1808) = 0.1101$$

$$GRG_{Candidate\ 5} = \frac{1}{5}\sum_{j=1}^{n} V_{15,55} = \frac{1}{5} * (0.0000 + 0.1095 + 0.1444 + 0.0750 + 0.0000) = 0.0658$$

$$GRG_{Candidate\ 6} = \frac{1}{5}\sum_{j=1}^{n} V_{16,56} = \frac{1}{5} * (0.1614 + 0.2189 + 0.0000 + 0.1500 + 0.0904) = 0.1242$$

$$GRG_{Candidate\ 7} = \frac{1}{5}\sum_{j=1}^{n} V_{17,57} = \frac{1}{5} * (0.0807 + 0.0000 + 0.2888 + 0.0750 + 0.1808) = 0.1251$$

The end result of the GRA method is the value of the proximity of each alternative to the ideal solution. The GRA is used to determine the best alternative from a number of options based on predetermined criteria. The GRA calculation process involves several steps, including data normalization, calculation of the degree of proximity between the alternative and the ideal solution, and calculation of the value of the gray relationship which is finally used to perform the ranking.

3.4. Recommendations for Promotion of Chief Financial Officer

Recommendations for promotion of the CFO position can be made using the GRA method combined with objective weighting using the CRITIC method. The first step is to identify important criteria for candidate assessment, such as financial performance, managerial abilities, work experience, leadership, and strategic competencies. Once the criteria are determined, each candidate's assessment data is collected and calculated based on the scores provided by the assessment team. Furthermore, the weights for each criterion are determined using the CRITIC method, which takes into account the variation and correlation between the criteria. After that, the data is normalized so that it can be compared proportionally. The GRA method is then used to calculate the proximity of each candidate to the ideal solution, which shows how well the candidate meets the predetermined criteria. The candidate with the highest Grey affinity score will be the best and recommended for promotion to the CFO position. Figure 2 is the result of the CFO promotion recommendation.

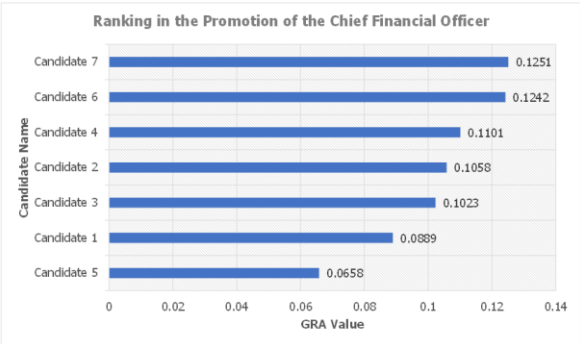

Figure 2. Ranking in the Promotion of the Chief Financial Officer

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The graph in Figure 2 shows the ranking of candidates in the promotion of the position of Chief Financial Officer based on their respective evaluation scores. Candidate 7 in first place with the highest score of 0.1251, Candidate 6 with a score of 0.1242 in second place. Candidate 4 is in third place with a score of 0.1101, while Candidate 2 with a score of 0.1058 occupies the fourth position, and Candidate 3 with a score of 0.1023 in fifth position. Candidate 1 obtained a score of 0.0889 in sixth place, while Candidate 5 took the last position with the lowest score, which was 0.0658. This shows that Candidates 7 and 6 have a clear competitive advantage compared to other candidates for the position.

Contribution to the promotion of the CFO position is crucial in ensuring that decisions made in the assessment of candidates are not only based on intuition or subjective considerations, but through a systematic, objective, and data-driven approach. One of the main contributions is the use of an analysis method that can assess the performance, ability, and competence of candidates comprehensively using GRA combined with an objective weighting method using CRITIC. This method makes it possible to calculate the proximity of candidates to the ideal criteria that have been determined, as well as give weight to each criterion based on its level of importance. With this approach, companies can identify the best qualified candidates for the CFO position, which will have a direct impact on the company's financial management, strategic decision-making, and the achievement of the organization's long-term goals. In addition, this method also helps in reducing bias in decision-making, increasing transparency in the selection process, as well as providing confidence to employees and stakeholders that promotions are based on fair and objective judgment. Another contribution is to increase effectiveness and efficiency in the promotion process, as decisions can be made faster and based on clear and measurable data.

4. CONCLUSION

This research aims to implement an objective and accurate decision support system in the promotion process of the Chief Financial position by implementing the GRA method and objective weighting. By combining these two approaches, this study seeks to comprehensively evaluate the candidate's performance based on relevant criteria, such as managerial ability, financial competence, strategic analysis ability, and leadership. The results of this study are expected to help organizations in making more transparent, fair, and data-driven promotion decisions, as well as increase accuracy in selecting the most deserving candidates to occupy these strategic positions. The implementation of objective weighting and the GRA method in the CFO promotion process is a decision that must consider various important criteria, such as financial performance, leadership, managerial ability, and experience. Therefore, this study uses GRA to evaluate alternative CFO candidates based on their proximity to the ideal solution, while the Objective Weighting method uses CRITIC, used to objectively determine the weight of the criteria, avoiding subjective bias in the assessment. Through the application of these methods, it is hoped that it can provide a more systematic, transparent, and objective approach in selecting CFO candidates who meet the best criteria to advance the company.

The ranking results show the ranking of candidates in the promotion of the Chief Financial Officer position based on their respective evaluation scores. Candidate 7 in first place with the highest score of 0.1251, Candidate 6 with a score of 0.1242 in second place. Candidate 4 is in third place with a score of 0.1101, while Candidate 2 with a score of 0.1058 occupies the fourth position. This shows that Candidates 7 and 6 have a significant competitive advantage over other candidates for the position. The main contribution in the promotion of the CFO position is the use of an analysis method that can assess the performance, ability, and competence of candidates as a whole using GRA combined with an objective weighting method using CRITIC.

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