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Best Sales Selection Using a Combination of Reciprocal Rank Weighting Method and Multi-Attribute Utility Theory

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Abstract− The best salespeople are individuals who are not only able to meet or exceed sales targets, but also demonstrate exceptional skills in building relationships with customers, understanding their needs, and offering effective solutions. The problem of selecting the best salespeople often involves the challenge of an objective and fair assessment, as diverse evaluation criteria can affect the final result. One of the main obstacles is the presence of subjectivity in judgment, which can arise from personal preferences or pressure to maintain good relationships. This study aims to implement a sales performance evaluation model that combines the Reciprocal Rank Weighting and Multi-Attribute Utility Theory (MAUT) methods to obtain a more accurate and objective assessment of sales performance. This research contributes to the management literature and decision support systems by offering a new approach in sales performance evaluation. This opens up opportunities for further research and practical applications in the field of performance evaluation and salesforce management. Based on the final score calculated using the MAUT method, the salesperson rank from best to lowest is as follows: Sales 7 is ranked top with a value of 0.646, indicating the best overall performance. Sales 3 followed in second place with a value of 0.6125, followed by Sales 9 with a value of 0.5604 in third position.

Keywords: Multi-Attribute Utility Theory; Objective Assessment; Performance; Rank Reciprocal Weighting; Salesperson

1. INTRODUCTION

The best salespeople are individuals who are not only able to meet or exceed sales targets, but also demonstrate exceptional skills in building relationships with customers, understanding their needs, and offering effective solutions. They typically have excellent communication skills, keen negotiation skills, and a proactive attitude in seeking out new opportunities. In addition, the best salespeople often have a deep understanding of the products or services they offer, as well as being able to adapt quickly to market changes. With a strong combination of technical and interpersonal skills, they play a key role in increasing the company's revenue and building long-term customer loyalty. The selection of the best sales is a critical process in human resource management that aims to identify the individuals with the most superior sales performance. This process involves a thorough assessment of various aspects, such as achieving sales targets, the ability to build and maintain customer relationships, and skills in negotiation and problem-solving. In addition, factors such as innovation in sales strategies and contributions to team development are also taken into account. By using systematic and data-driven evaluation methods, companies can ensure that the best sales selection decisions are based on objective performance and potential long-term contributions, thus supporting the achievement of the company's overall goals. The problem in selecting the best sales often involves the challenge of an objective and fair assessment, as diverse evaluation criteria can affect the final result. One of the main obstacles is the existence of subjectivity in judgment, which can arise from personal preferences or pressure to maintain good relationships. Additionally, the data used for evaluation is often incomplete or inaccurate, making it difficult to make consistent comparisons between candidates. Limitations in performance measurement systems can also result in incomplete assessments, not covering all the important aspects of the sales role. Addressing this issue requires the implementation of transparent and data-driven evaluation methods, as well as adequate training for the assessing party to ensure fair and accurate decisions.

The Multi-Attribute Utility Theory (MAUT) method is an approach used in complex multi-criteria decision-making, where various relevant attributes or factors must be considered[1][2][3][4]. MAUT helps decision-makers to evaluate and compare existing alternatives by assigning utility values to each attribute. These utility values reflect the decision maker's preference for each attribute, which is then combined into the total utility score for each alternative. Using MAUT, decision-makers can objectively determine the alternatives that best suit their goals and preferences based on a systematic and structured analysis. This method is often used in a variety of fields, including economics, management, and engineering, to aid in optimal decision selection. The advantage of the MAUT method lies in its ability to handle decision-making involving many criteria in a systematic and transparent way. MAUT allows decision-makers to explicitly express their preferences for a variety of different attributes, thus giving appropriate weight to each criterion based on its importance. In addition, this method can accommodate uncertainty in judgment by using utility functions that reflect the level of satisfaction or risk of each choice[5][6]. MAUT also has the flexibility to be applied in various decision contexts, ranging from business to engineering, and is able to provide comprehensive and easy-to-understand results. The integration of subjective and objective preferences in the decision-making process makes MAUT an effective tool to produce optimal solutions. While Multi-Attribute Utility Theory (MAUT) offers many advantages, it also has some disadvantages. One of its main drawbacks is the complexity of determining the exact utility function for each attribute, which can be difficult and time-consuming, especially if it involves many criteria and alternatives. This process also requires intensive participation from the decision-maker, who must have a good understanding of his or her own preferences, something that is not always easy or obvious. In addition, MAUT is highly dependent on the quality and

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accuracy of input data, so errors in judgment or weighting can result in less than optimal decisions. These methods also tend to be subjective, as individual preferences can vary widely, which may lead to different results if used by different decision-makers.

The Reciprocal Rank weighting method is a technique used to determine the relative weights of various criteria in multi-criteria decision-making[7][8]. In this method, the criteria are ranked according to their level of importance, with the most important criteria being ranked at the top. The weight for each criterion is then calculated by inverting its ranking, so that the highest-ranked criterion gets the most weight. After that, these weights are normalized so that the total number is 1. The Rank Reciprocal method is simple and easy to implement, and provides an intuitive way to incorporate the subjective preferences of decision-makers into the assessment process, facilitating a more objective and structured analysis[9][10]. The advantage of the Reciprocal Rank weighting method lies in its simplicity and ease of application. This method does not require complex calculations, so it can be used quickly by decision-makers even with time or data constraints. By reversing the ranking of criteria into weights, this method automatically gives higher priority to more important criteria, without the need for explicit weight grading, which is sometimes difficult to do. In addition, the Rank Reciprocal method maintains consistency in the weight distribution, as the weight is given in proportion to the criterion ranking[11]. Its flexibility and transparency make it suitable for a wide range of decision-making situations involving multiple criteria, especially when detailed quantitative data is not available.

The combination of the Reciprocal Rank weighting method and the MAUT method offers a powerful approach to multi-criteria decision-making. By combining these two methods, decision-makers can efficiently determine the weight of the criteria using Rank Reciprocal, which gives weights based on the importance rating of the criteria, and then apply MAUT to evaluate and combine the utility values of each alternative based on the predetermined weights. This process allows for a more structured and transparent analysis, as proportionally determined weights are used to measure the utility of each alternative more objectively. This combination is particularly effective in situations where subjective preferences must be integrated with a comprehensive utility analysis, resulting in optimal decisions and in accordance with the decision-maker's objectives. The combination of Rank Reciprocal and MAUT weighting methods provides flexibility in dealing with a variety of complex decision-making situations. The result is a balanced approach between efficiency and accuracy, where decisions can be made taking into account the weighting of the appropriate criteria and a detailed evaluation of each available option. This approach is particularly suitable for use in a variety of contexts, such as project management, supplier selection, or business strategy selection, where decisions must be made taking into account many interrelated factors.

The research conducted by Edinsel (2023) explores how the Multi-Criteria Decision Making (MCDM) method can be used to select the best sales manager. The methods used include the Analytic Hierarchy Process (AHP) and the Technique for Order Preference by Similarity to Ideal Solution (TOPSIS). The results show that MCDM can help increase objectivity in decision-making and choose the sales manager that best suits the company's needs[12]. Research conducted by Hadad (2024) combines the Pairwise Relative Criteria Importance Assessment (PIPRECIA) and Measurement of Alternatives and Ranking According to Compromise Solution (MARCOS) to form a holistic approach that is effective in decision-making[13]. Research conducted by Azmi (2023) The merger of Fuzzy Logic, EDAS, and Borda methods results in an effective decision-making process that allows retail sellers to make the right decisions and achieve their business goals[14]. The research was conducted by Setyowati (2023) a website-based decision support system that aims to assist company leaders in selecting the best sales in their company using the Multi-Objective Optimization on the basis of Ratio Analysis (MOORA) method[15]. The difference with the research conducted is that in this study a combination of reciprocal and MAUT rank weighting methods are used to determine the best salesperson.

This study aims to implement a sales performance evaluation model that combines the Reciprocal Rank Weighting and Multi-Attribute Utility Theory (MAUT) methods to obtain a more accurate and objective assessment of sales performance. This research contributes to the management literature and decision support systems by offering a new approach in sales performance evaluation. This opens up opportunities for further research and practical applications in the field of performance evaluation and salesforce management.

2. RESEARCH METHODOLOGY

2.1 Research Stages

The research framework provides systematic and structured guidelines for companies in selecting the best sales objectively and effectively[16][17]. With this innovative combination of methods, companies can more fairly and accurately determine the weight of assessment criteria, and make more informed decisions based on a variety of relevant attributes. In addition, this research also contributes to the development of theories and methods in the field of multi-criteria decision-making, so that it can be used as a reference for other researchers in the context of employee selection or other strategic decision-making. The framework of the research made is shown in Figure 1.

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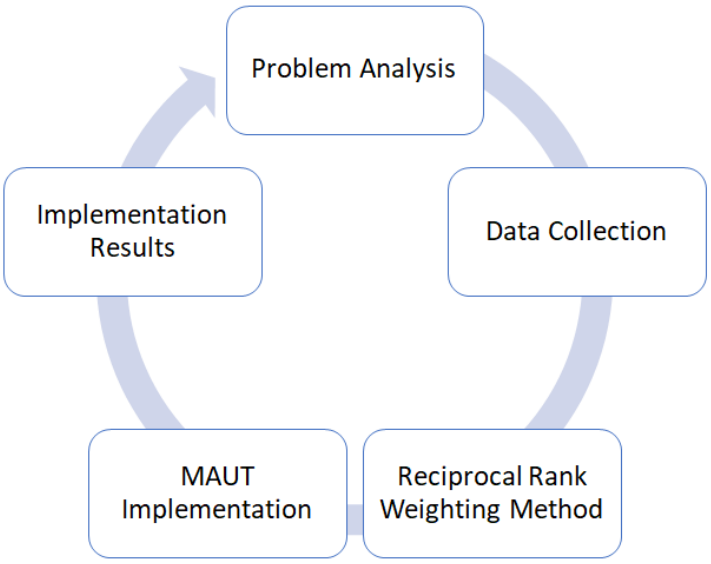

Figure 1. Research Stage

The research stages in figure 1 consist of several stages that are carried out, namely the data collection stage begins by identifying relevant data sources, such as sales performance assessment results, sales data, customer feedback, and other information that can affect the evaluation. This data can be obtained through various methods, such as surveys, interviews, observations, or from existing company management systems. It is important to ensure that the data collected includes all the criteria that have been set to assess sales performance, so that the evaluation results can later be more accurate and comprehensive. Once the data is collected, the next step is to assign weights to each scoring criterion using the Reciprocal Rank Weighting Method. This method gives weight by flipping the ranking of each criterion, so that the criteria with a higher rating get a lower weight, and vice versa. This technique helps to reduce subjectivity in weighting, ensuring that the weighting of criteria is carried out proportionally based on their importance in the overall evaluation.

Once the criteria weights are determined, the next step is to apply Multi-Attribute Utility Theory (MAUT) to evaluate sales performance. In this stage, each salesperson is assessed based on predetermined criteria, taking into account the weight generated from the Reciprocal Rank Weighting Method. MAUT allows the calculation of the utility of each alternative (in this case, sales) by combining various attributes or criteria into a single aggregate value. The end result is the ranking of each sales based on their total utility value. After the implementation of MAUT, the final result in the form of a list of the best sales rankings will be obtained. This result reflects how well each sales person meets the criteria that have been set, based on the previously calculated weights. With the results of this implementation, companies can make more precise and measurable decisions in choosing the best sales, as well as gain insight into which aspects need to be improved in the future.

2.2 Rank Reciprocal Weighting Method

The Rank Reciprocal Weighting Method is a weighting technique used in multi-criteria decision-making[8][11]. This method weights the criteria based on their rankings by using the inverse of those rankings. The advantages of this method are its simplicity in application as well as its ability to reduce subjectivity in determining the weight of criteria. Since the weight is determined proportionally based on the ranking, this method ensures that the criteria with higher importance get the greater weight fairly. This method is particularly suitable for use in situations where the weight of the criteria needs to be done quickly and does not require complex calculations. The reciprocal rank is calculated using the following equation.

$$w_j = \frac{\frac{1}{j}}{\sum_{j=1}^{m} \frac{1}{j}} \quad (1)$$

w_j is the weight of criterion, and j is the rank of criterion.

2.3 Multi-Attribute Utility Theory Method

Multi-Attribute Utility Theory (MAUT) is a method in decision-making that is used to evaluate various alternatives based on several criteria or attributes[3][18]. MAUT allows decision-makers to combine the values of each attribute into a single overall utility measure, which represents the most desirable preference or value of the available alternatives. In MAUT, each attribute is weighted based on its importance, and alternatives are evaluated based on how well they meet each of those attributes. This method is very useful in situations where decision-making must consider many different factors and provide a rational and optimal solution. The Decision Matrix in MAUT is a tabular representation that shows the relationship between alternatives and criteria. This matrix contains the score or value assigned to each alternative based

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on each criterion. This matrix is the basis for calculating the total utility value for each alternative. The decision matrix is created using the following equation.

$$X = \begin{bmatrix} x_{11} & x_{21} & x_{n1} \\ x_{12} & x_{22} & x_{n2} \\ \vdots & \vdots & \vdots \\ x_{1m} & x_{2m} & x_{nm} \end{bmatrix} \quad (2)$$

Normalization of the decision matrix is necessary to convert the values of various criteria into a uniform scale, usually between 0 and 1, in order to be fairly compared. There are several commonly used normalization methods, but the most common is linear normalization, where the values of each element in the decision matrix are normalized based on a specific formula depending on the type of criteria (profit or cost). The normalization of the decision atriks is made using the following equation.

$$r_{ij}^{*} = 1 + \frac{\min x_{ij} - x_{ij}}{\max x_{ij} - \min x_{ij}} \quad (3)$$

$$r_{ij}^{*} = \frac{x_{ij} - \min x_{ij}}{\max x_{ij} - \min x_{ij}} \quad (4)$$

Equation (3) is used to calculate the normalization value of the cost criterion, and equation (4) is used to calculate the normalization value of the benefit criterion.

Utility value is a metric used in decision-making to assess and compare various alternatives based on normalized criteria. This value reflects the level of preference of decision-makers towards different alternatives, with higher values indicating a greater level of preference. The utility value is calculated using the following equation.

$$u_{ij} = \frac{e^{\left(\left(r_{ij}^{*}\right)^{2}\right)} - 1}{1.71} \quad (5)$$

The final value of the utility in the context of Multi-Attribute Utility Theory (MAUT) is calculated by combining the weight of the criteria with the normalized value that has been calculated for each alternative. The total utility value for each alternative indicates how well the alternative meets all the existing criteria. The final value of the utility is calculated using the following equation.

$$u_{(x)} = \sum_{j=1}^{n} u_{ij} * w_j \quad (6)$$

The utility value of this criterion shows the contribution of each criterion to the total utility value for each alternative. This value reflects how well the alternative meets each criterion, after considering the importance of each criterion through predetermined weights.

3. RESULT AND DISCUSSION

The study on Best Sales Selection Using a Combination of Reciprocal Rank Weighting Method and Multi-Attribute Utility Theory aims to identify the best sales by integrating two key evaluation methods. The Reciprocal Rank Weighting method is used to give weight to various criteria based on their relative rank, where the higher the rating criterion gets more weight. Then, Multi-Attribute Utility Theory (MAUT) is applied to evaluate and compare alternatives based on the weight of predetermined criteria, as well as the normalization score of each alternative. This approach allows for more objective and structured decision-making, by measuring sales performance comprehensively and based on clear preferences, resulting in more accurate recommendations for choosing the best salesperson. By combining the Reciprocal Rank Weighting and Multi-Attribute Utility Theory methods, the study not only ensures that the criteria are weighted fairly according to their relevance, but also that the evaluation is carried out systematically taking into account various important attributes. Reciprocal Rank Weighting helps in prioritizing criteria based on relative rankings that reflect the significance of each in the selection process. Meanwhile, MAUT integrates the criterion weights with the normalization value to objectively calculate the total utility of each alternative. This approach results in an in-depth and comprehensive analysis, allowing for sales selection that not only optimally meets the criteria but also reflects the organization's strategic preferences. The result is more effective and impactful recommendations in sales selection, which can improve the efficiency and performance outcomes of the sales team.

3.1 Data Collection

Data collection is an important initial stage in the evaluation process using the Multi-Attribute Utility Theory (MAUT) and Reciprocal Rank Weighting methods. This stage involves gathering the necessary information to determine the criteria to be used in the evaluation as well as the relevant data for each criterion. In selecting the best sales, several criteria that are generally used to assess the performance and potential of potential sales include various aspects that affect sales success.

1. Monthly Sales: Measures the volume of sales generated by a salesperson in a monthly period.

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2. Customer Satisfaction: An assessment of the level of customer satisfaction served by sales, often measured through surveys or customer feedback.
3. Presentation Skills: The ability to deliver effective and convincing sales presentations.
4. Product Knowledge: The level of knowledge that sales have about the product or service they are selling.
5. Communication Skills: Ability to communicate.

Sales Performance Assessment Data Collection is an important process in evaluation to determine sales performance effectively. This stage involves gathering relevant and accurate information about various aspects of sales performance for an objective and comprehensive assessment. The process of collecting sales performance appraisal data will be more structured, ensuring that the information used for evaluation is complete, accurate, and reliable. This will improve the quality of decisions in selecting and managing the best performing sales. The results of the salesperson performance assessment are displayed in Table 1.

Table 1. The Results Of The Salesperson Performance Assessment

Salesperson Name	Monthly Sales	Customer Satisfaction	Presentation Skills	Product Knowledge	Communication Skills
Salesperson 1	8	9	7	8	9
Salesperson 2	7	8	9	7	8
Salesperson 3	9	7	8	9	7
Salesperson 4	6	9	6	8	8
Salesperson 5	8	8	9	7	7
Salesperson 6	7	7	8	6	9
Salesperson 7	9	8	7	9	8
Salesperson 8	6	6	8	7	7
Salesperson 9	8	9	9	8	8

The assessment data from each salesperson in table 1 will be used in the selection of the best salesperson using the recoprocal rank weighting method and the MAUT method.

3.2 Weight Determination Using the Reciprocal Rank Method

Weight Determination Using the Reciprocal Rank Method is the process of assigning weight to various criteria based on their relative rank. This method allows for fair weight determination by converting criterion rankings into weight values using the concept of reciprocal rank. The weight of the criteria is calculated using equation (1).

$$w_1 = \frac{\frac{1}{j_1}}{\frac{1}{j_1}+\frac{1}{j_2}+\frac{1}{j_3}+\frac{1}{j_4}+\frac{1}{j_5}} = \frac{\frac{1}{1}}{\frac{1}{1}+\frac{1}{2}+\frac{1}{3}+\frac{1}{4}+\frac{1}{5}} = \frac{1}{2.283} = 0.438$$

$$w_2 = \frac{\frac{1}{j_2}}{\frac{1}{j_1}+\frac{1}{j_2}+\frac{1}{j_3}+\frac{1}{j_4}+\frac{1}{j_5}} = \frac{\frac{1}{2}}{\frac{1}{1}+\frac{1}{2}+\frac{1}{3}+\frac{1}{4}+\frac{1}{5}} = \frac{0.5}{2.283} = 0.219$$

$$w_3 = \frac{\frac{1}{j_3}}{\frac{1}{j_1}+\frac{1}{j_2}+\frac{1}{j_3}+\frac{1}{j_4}+\frac{1}{j_5}} = \frac{\frac{1}{3}}{\frac{1}{1}+\frac{1}{2}+\frac{1}{3}+\frac{1}{4}+\frac{1}{5}} = \frac{0.333}{2.283} = 0.146$$

$$w_4 = \frac{\frac{1}{j_4}}{\frac{1}{j_1}+\frac{1}{j_2}+\frac{1}{j_3}+\frac{1}{j_4}+\frac{1}{j_5}} = \frac{\frac{1}{4}}{\frac{1}{1}+\frac{1}{2}+\frac{1}{3}+\frac{1}{4}+\frac{1}{5}} = \frac{0.25}{2.283} = 0.109$$

$$w_5 = \frac{\frac{1}{j_5}}{\frac{1}{j_1}+\frac{1}{j_2}+\frac{1}{j_3}+\frac{1}{j_4}+\frac{1}{j_5}} = \frac{\frac{1}{5}}{\frac{1}{1}+\frac{1}{2}+\frac{1}{3}+\frac{1}{4}+\frac{1}{5}} = \frac{0.2}{2.283} = 0.088$$

Monthly Sales Criterion (0.438): Has the highest weight because it is considered the most important criterion in sales evaluation. This weight reflects a significant emphasis on the volume of sales generated. Customer Satisfaction Criterion (0.219): This weight shows the importance of customer satisfaction as an indicator of sales performance. This criterion is the second priority after monthly sales. Presentation Skills Criteria (0.146): This weight reflects the importance of presentation skills in the sales process. While important, this criterion has a lower weight compared to sales and customer satisfaction. Product Knowledge Criterion (0.109): This weight indicates the importance of product knowledge in sales performance. This criterion is an important factor but not as heavy as sales or customer satisfaction. Communication Skills Criteria (0.088): Has the lowest weight, but is still relevant in the overall assessment. Communication skills remain important, but are considered less important compared to the other criteria in this evaluation. This weight will be used in the analysis to evaluate sales performance based on predetermined criteria, taking into account how well they meet each of the criteria that have been assessed.

3.3 Selection of the Best Salesperson Using the MAUT Method

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Selecting the Best Salesperson Using the MAUT (Multi-Attribute Utility Theory) Method involves evaluating and ranking salespeople based on various criteria with a structured approach. The Decision Matrix in MAUT is a tabular representation that shows the relationship between alternatives and criteria. This matrix contains the score or value assigned to each alternative based on each criterion. This matrix is the basis for calculating the total utility value for each alternative. The decision matrix is created using the following equation (2).

$$X = \begin{bmatrix} 8 & 9 & 7 & 8 & 9 \\ 7 & 8 & 9 & 7 & 8 \\ 9 & 7 & 8 & 9 & 7 \\ 6 & 9 & 6 & 8 & 8 \\ 8 & 8 & 9 & 7 & 7 \\ 7 & 7 & 8 & 6 & 9 \\ 9 & 8 & 7 & 9 & 8 \\ 6 & 6 & 8 & 7 & 7 \\ 8 & 9 & 9 & 8 & 7 \end{bmatrix}$$

Matrix Normalization Value Calculation is an important step in the evaluation process using the MAUT method, to ensure that all data are on the same scale so that they can be fairly compared. Matrix normalization is calculated using equation (4) because all criteria are beneficial.

$$r_{11}^{*} = \frac{x_{11} - \min x_{11,19}}{\max x_{11,19} - \min x_{11,19}} = \frac{8-6}{9-6} = 0.667$$

The results of the normalization calculation show that the performance value of each salesperson has been standardized to facilitate a fair comparison between the criteria as shown in table 2.

Table 2. The Results Of The Normalization Calculation

Salesperson Name	Monthly Sales	Customer Satisfaction	Presentation Skills	Product Knowledge	Communication Skills
Salesperson 1	0.667	1	0.333	0.667	1
Salesperson 2	0.333	0.667	1	0.333	0.5
Salesperson 3	1	0.333	0.667	1	0
Salesperson 4	0	1	0	0.667	0.5
Salesperson 5	0.667	0.667	1	0.333	0
Salesperson 6	0.333	0.333	0.667	0	1
Salesperson 7	1	0.667	0.333	1	0.5
Salesperson 8	0	0	0.667	0.333	0
Salesperson 9	0.667	1	1	0.667	0.5

Utility value is a metric used in decision-making to assess and compare various alternatives based on normalized criteria. This value reflects the level of preference of decision-makers towards different alternatives, with higher values indicating a greater level of preference. The utility value is calculated using the following equation (5).

$$u_{11} = \frac{e((r_{11}^{*})^2) - 1}{1.71} = \frac{e((0.667)^2) - 1}{1.71} = 0.3273$$

The results of the Utility value show that the performance value of each salesperson has been standardized to facilitate a fair comparison between the criteria as shown in table 3.

Table 3. The Results Of The Utility Value

Salesperson Name	Monthly Sales	Customer Satisfaction	Presentation Skills	Product Knowledge	Communication Skills
Salesperson 1	0.3273	1.0048	0.0687	0.3273	1.0048
Salesperson 2	0.0687	0.3273	1.0048	0.0687	0.1661
Salesperson 3	1.0048	0.0687	0.3273	1.0048	0
Salesperson 4	0	1.0048	0	0.3273	0.1661
Salesperson 5	0.3273	0.3273	1.0048	0.0687	0
Salesperson 6	0.0687	0.0687	0.3273	0	1.0048
Salesperson 7	1.0048	0.3273	0.0687	1.0048	0.1661
Salesperson 8	0	0	0.3273	0.0687	0
Salesperson 9	0.3273	1.0048	1.0048	0.3273	0.1661

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The final value of the utility in the context of Multi-Attribute Utility Theory (MAUT) is calculated by combining the weight of the criteria with the normalized value that has been calculated for each alternative. The total utility value for each alternative indicates how well the alternative meets all the existing criteria. The final value of the utility is calculated using the following equation (6).

$$u_{(1)} = (u_{11} * w_1) + (u_{12} * w_2) + (u_{13} * w_3) + (u_{14} * w_4) + (u_{15} * w_5)$$

$$u_{(1)} = (0.3273 * 0.438) + (1.0048 * 0.219) + (0.0687 * 0.146) + (0.3273 * 0.109) + (1.0048 * 0.088)$$

$$u_{(1)} = 0.4975$$

The results of the final utility value show that the performance value of each salesperson as shown in table 4.

Table 4. The Results Of The Final Utility Value

Salesperson Name	Final Utility Value
Salesperson 1	0.4975
Salesperson 2	0.2706
Salesperson 3	0.6125
Salesperson 4	0.2703
Salesperson 5	0.3692
Salesperson 6	0.1814
Salesperson 7	0.6460
Salesperson 8	0.0553
Salesperson 9	0.5604

The final value of the MAUT (Multi-Attribute Utility Theory) method is a comprehensive result of utility evaluation and calculation based on criteria that have been normalized and weighted. Once the data is normalized for each criterion, these values are multiplied by the weights of their respective criteria to produce a weighted utility score. These scores are then summed up for each alternative, providing a final score that reflects overall performance in the context of all evaluation criteria. This final score allows for objective comparisons between alternatives and facilitates decision-making by indicating the most suitable or optimal alternative based on preferences and the weight of predetermined criteria.

3.4 Implementations Result

The results of the implementation of the MAUT method provide clear insights into the performance of each salesperson based on a thorough assessment of various criteria. After integrating the normalized data with the criteria weights, a final utility score is calculated for each salesperson, resulting in a ranking that reflects their overall performance in important aspects such as Monthly Sales, Customer Satisfaction, Presentation Skills, Product Knowledge, and Communication Skills. The results of this implementation not only show the salesperson with the highest score, but also provide an objective and structured base for strategic decision-making, assisting managers in selecting the best candidates by comprehensively considering all aspects of evaluation. The results of the best salesperson ranking are shown in figure 2.

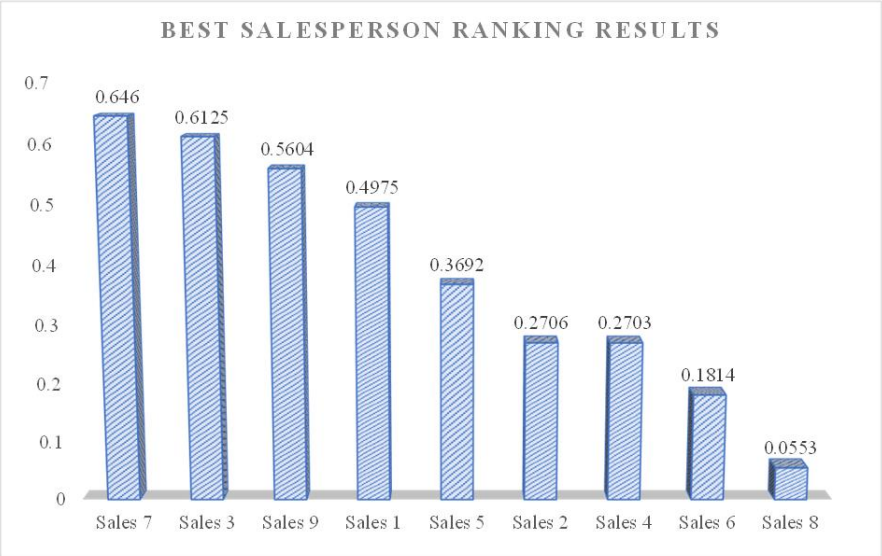

Figure 2. Best Salesperson Ranking Results

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Based on the final score calculated using the MAUT method, the salesperson rank from best to lowest is as follows: Sales 7 is ranked top with a value of 0.646, indicating the best overall performance. Sales 3 followed in second place with a value of 0.6125, followed by Sales 9 with a value of 0.5604 in third position. Sales 1 is ranked fourth with a value of 0.4975, while Sales 5 is in fifth position with a value of 0.3692. Sales 2 and Sales 4 are in sixth and seventh positions with values of 0.2706 and 0.2703, respectively. Sales 6 is ranked eighth with a value of 0.1814, and Sales 8 is in last position with a value of 0.0553. This ranking reflects the results of a thorough evaluation based on predetermined criteria, providing a clear picture of the relative performance of each salesperson.

4. CONCLUSION

The study on Best Sales Selection Using a Combination of Reciprocal Rank Weighting Method and Multi-Attribute Utility Theory aims to identify the best sales by integrating two key evaluation methods. The Reciprocal Rank Weighting method is used to give weight to various criteria based on their relative rank, where the higher the rating criterion gets more weight. Then, Multi-Attribute Utility Theory (MAUT) is applied to evaluate and compare alternatives based on the weight of predetermined criteria, as well as the normalization score of each alternative. This approach allows for more objective and structured decision-making, by measuring sales performance comprehensively and based on clear preferences, resulting in more accurate recommendations for choosing the best salesperson. By combining the Reciprocal Rank Weighting and Multi-Attribute Utility Theory methods, the study not only ensures that the criteria are weighted fairly according to their relevance, but also that the evaluation is carried out systematically taking into account various important attributes. Reciprocal Rank Weighting helps in prioritizing criteria based on relative rankings that reflect the significance of each in the selection process. Meanwhile, MAUT integrates the criterion weights with the normalization value to objectively calculate the total utility of each alternative. This approach results in an in-depth and comprehensive analysis, allowing for sales selection that not only optimally meets the criteria but also reflects the organization's strategic preferences. The result is more effective and impactful recommendations in sales selection, which can improve the efficiency and performance outcomes of the sales team. Based on the final score calculated using the MAUT method, the salesperson rank from best to lowest is as follows: Sales 7 is ranked top with a value of 0.646, indicating the best overall performance. Sales 3 followed in second place with a value of 0.6125, followed by Sales 9 with a value of 0.5604 in third position.

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