

Improving Decision-Making and Organizational Sustainability through the Integration of Management Information Systems and Multi-Criteria Decision-Making Techniques

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Abstract

Improving the decision-making is a target for all organizations to achieve their goals, reach the organization's vision and mission. Management Information Systems (MIS) play a critical role in the organizations as it provides the essential facilitation in enhancing the decision-making process and fostering organizational sustainability. MIS can provide right relevant and accurate information on the right time. Information can be used to identify problems, develop and evaluate solutions, track progress towards goals. Multi-criteria decision making (MCDM) (AHP, entropy, Technique for Order Preference by Similarity to Ideal Solution (TOPSIS)) model can be used to select the most suitable alternative based on the organization's criteria. MIS can also help organizations to become more sustainable by improving efficiency, reducing waste, mitigating risks, improving communication, increasing collaboration, and enhancing decision making. This can lead to increased profitability, reduced environmental impact, and improved long-term sustainability. This study investigates the role of MIS in enhancing decision-making processes and organizational sustainability. This research explores the use of MCDM methods, with a focus on TOPSIS, to evaluate how MIS can improve decision-making and foster sustainable practices within organizations. It looks at how MIS is integrated across different industries, stressing the importance of making decisions based on data and aligning MIS with a company's goals. MIS helps the organizations in ensuring strategic organizational alignment, especially when paired with advanced MCDM techniques. The study provides recommendations for the organizations to strengthen the MIS systems they are using in the daily operation and how they can use to live sustainably for a long time.

Keywords

Management Information Systems, Decision-Making, Organizational Sustainability, Multi-Criteria Decision-Making, Technique for Order Preference by Similarity to Ideal Solution, Digital Transformation, Enterprise Resource Planning, Analytic Hierarchy Process, Entropy, ERP Selection

1. Introduction

In the current dynamic company landscape, the proficient handling of information is crucial for successful decision-making and long-term viability [1] [2]. Organizations encounter escalating complexity in amalgamating diverse data sources and operational systems. Management Information Systems (MIS) function as the foundation for real-time data processing, forecasting, and strategic planning [3] [4]. This article examines the influence of MIS on decision quality and its role in advancing sustainability objectives through operational efficiency, waste reduction, and risk mitigation. The selection of Enterprise Resource Planning (ERP) systems exemplifies a crucial application of MIS. ERP systems consolidate data across functions, so significantly impacting the organization's capacity to swiftly adapt to market fluctuations. Choosing the ideal ERP system necessitates a careful consideration of various factors, including cost, functionality, user-friendliness, scalability, vendor support, and integration possibilities. Multi-Criteria Decision-Making (MCDM) provides a mathematical way which can be very useful with the decision-making process. So, this paper is trying to present how we can use the hybrid way of mixing the methodologies with the integration between each other's. Meanwhile we can use Analytic Hierarchy Process (AHP) and Entropy with the Technique for Order Preference by Similarity to Ideal Solution (TOPSIS) method in ranking and enhancing the decision as example ERP selection which we are going to show in the case study. The paper also studies the integration between the Management Information Systems and the decision-making with providing a way to promote the organization sustainability. MIS is essential in contemporary enterprises, offering vital assistance for decision-making and operational effectiveness. Organizations are looking to enhance the MIS they own to be able to face the critical situations internally and externally so the need to build a complete and comprehensive framework is crucial for each organization which helps the different stakeholders to be confident and feel the significance in their organization MIS.

MIS not only flows the information across the different departments but also promotes the decision-makers capacity to address the different situations and gain the opportunities and efficiently cross the different available alternatives. This paper presents a complete framework that utilizes MCDM techniques to improve decision-making and enhance the organizational sustainability, and contributes

to the growing body of knowledge for the MIS with its impact on the organizational performance. As illustrated in **Figure 1**, it delineates the dependencies. The results provide actionable advice for firms aiming to improve their MIS frameworks and attain long-term sustainability. The specific sustainability goals of the study are improving resource utilization and reducing waste to reach the best operational efficiency which will reflect on the economy, social and environmental sustainability. The better decision making will minimize the risks, ensuring the organization can sustain the daily normal operations over the time which will ensure long term viability of the organizations [5]. So, the study shows that these goals can be achieved by the integration between MIS and MCDM techniques which help organizations make data-driven decisions that align with their sustainability objectives.

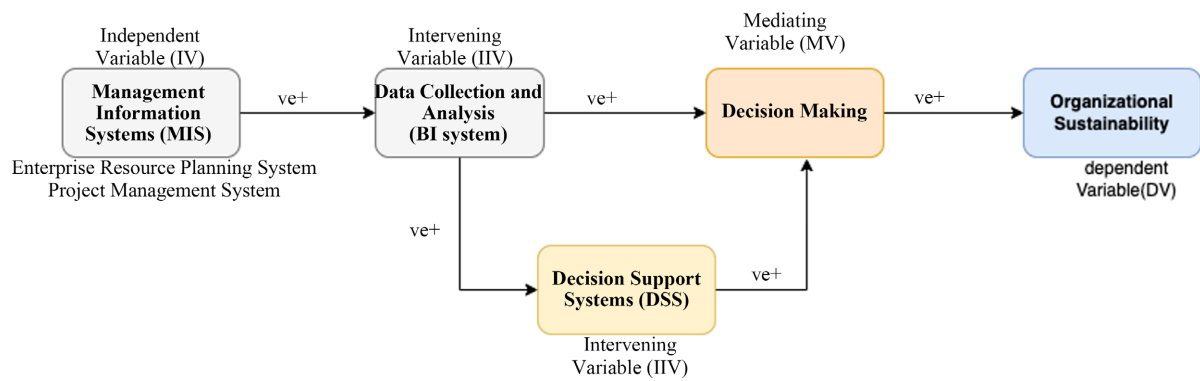


Figure 1. Theoretical framework.

The recent paper is structured as follows: Section 2 is literature review, Section 3 details the methodology of the prototype and describes how the experiment was conducted, Section 4 is case study, Section 5 discusses and analyzes the results of the experiments [6]-[8].

2. Literature Review

MIS are essential for integrating diverse organizational systems, facilitating uninterrupted data exchange, and improving interdepartmental collaboration. Decision-Making and MIS [9]: Effective decision-making depends on precise, prompt, and pertinent information. MIS can assist in providing necessary data and analytical tools for decision-makers, uncovering and refining insights, and aiding in the formulation of sound judgments [10]. The significant integration of Management Information Systems into decision-making increases the ability of businesses to respond to changing environments and achieve their strategic objectives. Researches such [11]-[13] have captured how MIS enhances decision making accuracy, speed and strategic recommendations using real time insights and data analytics. MIS provides a Strategic Data Repository that supports quantitative and qualitative decision-making models. Organizational sustainability refers to an organization's ability to continue its operations indefinitely while exerting a positive

impact on the world, as opposed to depleting the resources that are at the organization's disposal. MIS enables sustainability by ensuring that resources are used to their fullest and wastes are minimized, along with the enhancement of operational efficiency. In this era of competition, it is imperative for an organization to integrate its sustainability objectives with the Management Information system. It is based on the research [14]-[18] states that sustainability is reached when corporations increase operational efficiency, reduce waste, and engage in socially responsible behavior. MIS is used to manage sustainability by improving resources and managing environment. MCDM methods are widely used in several domains to refine decision-making processes and improve the overall effectiveness of the organizations. AHP, Entropy and TOPSIS methods have been heavily applied in various problems *e.g.*, supplier selection curriculum development: [19]. These approaches offer a comprehensive framework for assessing options with conflicting criteria, facilitating both subjective evaluation and objective data analysis.

3. Methodology

Table 1. Comparative analysis of MCDM methods: AHP, entropy, and TOPSIS.

Method	AHP	Entropy	TOPSIS
Purpose	Weighting and ranking Assessment and prioritization	Weighting	Ranking alternatives
Key Features	Comparisons between pairs, hierarchical structure, consistency verification	Objective variable weighing by how wide the data is spread	Negative ideal and ideal solution distance
Strengths	Administers subjective evaluations with a defined framework.	Fully data-driven, simple	Straightforward, simple to use, handles mixed data
Limitations	acquire intricate, subjective prejudice as Can become complex, subjective bias	Only Calculates weights and does not rank alternatives	Dependent on pre-set weights, linear assumptions

This study used a hybrid approach combining AHP (Analytic Hierarchy Process), Entropy, and TOPSIS (Technique for Order Preference by Similarity to Ideal Solution). AHP (Analytic Hierarchy Process): Used to determine the relative importance of criteria (*e.g.*, cost, functionality, scalability) through pairwise comparisons. This step ensures that subjective judgments from decision-makers are systematically incorporated. Entropy: Applied to calculate objective weights for criteria based on data variability. This method ensures that criteria with higher variability (and thus more information) are given greater importance. TOPSIS (Technique for Order Preference by Similarity to Ideal Solution): Used to rank ERP systems based on their distance from the ideal and negative-ideal solutions. This step combines the subjective weights from AHP and the objective weights from Entropy to provide a comprehensive ranking of alternatives. The hybrid approach combines the strengths of AHP (subjective weighting), Entropy (objective weighting), and TOPSIS (ranking) to ensure a balanced and robust decision-making

ing process. As AHP provides a structured way to incorporate expert opinions. And Entropy ensures that data-driven insights are considered. Also, TOPSIS ranks alternatives based on their overall performance across weighted criteria. As shown in **Table 1** it clearly presents the comparative analysis of the MCDM Methods so this study used different methods integrating both qualitative and quantitative research methodologies. The research design includes a literature analysis, case studies, and the application of MCDM techniques to evaluate the impact of MIS on decision-making and organization sustainability.

Framework for Multi-Criteria Decision-Making: The suggested decision framework encompasses the subsequent steps:

1. Specify the required criteria and the available alternatives.
2. List all the available alternatives for the problem.
3. Build the Decision Matrix
4. Normalize the Decision Matrix so that all values are on a comparable scale.

This can be done using the following formula:

$$r_{ij} = \frac{x_{ij}}{\sqrt{\sum_{i=1}^m x_{ij}^2}}$$

Where (r_{ij}) is the normalized value, (x_{ij}) is the performance score, and (m) is the number of alternatives.

5. Identify the Weighted Normalized Matrix.

$$V_j = w_j * r_j$$

Where w_j is the weight for criterion j .

6. Determine the Ideal and Negative Ideal Solutions, the ideal solution includes the best values for each criterion while the negative ideal solution contains the least favorable values for each criterion.

- Ideal solution:

$$A^+ = \{v_1^+, v_2^+, \dots, v_n^+\}$$

- Negative ideal solution:

$$A^- = \{v_1^-, v_2^-, \dots, v_n^-\}$$

7. Calculate the separation distance of each alternative from the ideal solution S_i^+ and the negative ideal solution S_i^- .

$$S_i^+ = \sqrt{\sum_{j=1}^n (v_{ij} - v_j^+)^2}$$

$$S_i^- = \sqrt{\sum_{j=1}^n (v_{ij} - v_j^-)^2}$$

8. Measure the relative near to the Ideal Solution.

$$C_i = \frac{S_i^-}{S_i^+ + S_i^-}$$

The best choice is the alternative with the highest C_i .

3.1. Entropy Method

The Entropy Method is an objective technique commonly used in Multi Criteria Decision Making to determine the relative importance of criteria based on the variability of data. Entropy analysis the distribution of the decision-making including the information, assigning higher weight to the most important criteria with the greater variability which means higher significance. This methodology is used when expert opinions are within the uncertainty cases, as it depends on the available data to determine the weights. Entropy method can be combined with other techniques like AHP or fuzzy logic to improve decision-making precision [20] [21]. Entropy method enhances the accuracy and reliability of MCDM models. It is useful when dealing with complex decision problems where multiple stakeholders and conflicting objectives are involved [22]-[24]. Entropy Integrates with other MCDM methods such as TOPSIS, AHP.

3.2. Steps to Implement the Entropy Method

These steps ensure that the Entropy Method provides an objective, data driven approach to assigning weights, which can be applied across a range of decision-making problems.

Step 1: Data normalization: where x_{ij} represents the performance value of alternative i under criterion j . For a matrix with m alternatives and n criteria:

$$P_{ij} = \frac{x_{ij}}{\sum_{i=1}^m x_{ij}}$$

Here, P_{ij} is the normalized value.

Step 2: Calculate the entropy for each criterion: The entropy E_j for criterion j is calculated using:

$$E_j = -k \sum_{i=1}^m x_{ij} \ln x_{ij}$$

Where $k = \frac{1}{\ln(m)}$ is a normalization constant, ensuring $0 \leq E_j \leq 1$.

If $r_{ij} = 0$, it is conventionally assigned a value near zero to avoid undefined logarithmic terms.

Step 3: Determine the objective weight based on the entropy concept: The degree of diversification $1 - E_j$ for each criterion measures the variability or usefulness of each criterion. The weight w_j for each criterion is derived by normalizing $1 - E_j$:

$$w_j = \frac{1 - E_j}{\sum_{j=1}^n (1 - E_j)}$$

Weights sum to 1 and reflect the relative importance of each criterion.

3.3. Analytic Hierarchy Process (AHP)

AHP is a decision-making method which is used in solving, analyzing and organ-

izing the complex decisions by using a hierarchy of goals, sub goals, criteria, and alternatives. AHP assists in the decision-making process by allowing both qualitative and quantitative assessment, ensuring decision-makers weigh parameters and compare alternatives. AHP has been applied in various domains, such as business strategy construction to supplier selection, firm accountability, to evaluation of services, etc. AHP accounts different viewpoints and contributions of the stakeholders into a common structure to choose the best respective and optimal alternative in relation to the existing decision context [25]-[27]. AHP is used within different fields as it can facilitate the way for the decision maker to select and solve the complex problems which includes many aspects and criteria that can be different from someone to another. AHP Organizes complex problems into manageable hierarchies. And Supports qualitative as well as quantitative data. This is then used to calculate the consistency ratio, which shows the reliability of the decision makers' judgments. It Is able to be combined with other decision-making approaches, like TOPSIS or VIKOR. AHP For a Dialogue and Team Structuring From the data, we form the Intensity Matrix method.

Step 1: Define the problem and build the hierarchy: The overall purpose of the decision-making process must be established. Break it down into a hierarchy with:

- The goal at the top.
- Criteria (and sub criteria, if any) in the middle.
- Alternatives at the bottom w_{ij} .

Step 2: Construct pairwise comparison matrices: For each level of the hierarchy:

Compare the elements (criteria or alternatives) pairwise based on their relative importance using a scale (Saaty's scale): 1-Equal importance. 2-Moderate importance. 3-Strong importance. 4-Very strong importance. 5-Extreme importance. Reciprocals (*e.g.*, 1/3, 1/5) for reverse comparisons. Form a pairwise comparison matrix is the relative importance of element i over j .

$$\begin{bmatrix} 1 & a_{12} & a_{13} & \cdots & a_{1n} \\ \frac{1}{a_{12}} & 1 & a_{23} & \cdots & a_{2n} \\ \frac{1}{a_{13}} & \frac{1}{a_{23}} & 1 & \cdots & a_{3n} \\ \vdots & \vdots & \vdots & \ddots & \vdots \\ \frac{1}{a_{1n}} & \frac{1}{a_{2n}} & \frac{1}{a_{3n}} & \cdots & 1 \end{bmatrix}$$

Step 3: Normalize the pairwise comparison matrix: Normalize each column of the matrix:

$$r_{ij} = \frac{x_{ij}}{\sum_{i=1}^n x_{ij}}$$

Where ij is the number of criteria.

Step 4: Calculate the priority vector: Compute the priority vector (weights) for each criterion by averaging the normalized values across rows:

$$r_{ij} = \text{Average} \left(\sum_{i=1}^n r_{ij} \right)$$

Step 5: Check consistency: To ensure that the judgments are consistent:

1. Calculating Consistency = Criteria Weights * Value of x_{ij}
2. Calculating Consistency Index = Weighted Sum Values/Criteria weight

$$\lambda_{\max} = \frac{\text{SUM}}{\text{no. of criterias}}$$

3. Compute the index (CI): λ_{\max} is the largest actual value of the pairwise comparison matrix A.

$$\text{CI} = \frac{\lambda_{\max} - n}{n - 1}$$

4. Compute the consistency ratio (CR):

$$\text{CR} = \frac{\text{CI}}{\text{RI}}$$

Where RI is the random index

5. A $\text{CR} < 0.1$ indicates acceptable consistency. If $\text{CR} > 0.10$, revise the pairwise comparisons.

Analytic Hierarchy Process (AHP) is a decision-making method that helps to prioritize and make complex decisions by breaking them down into a hierarchy of criteria and alternatives [28]-[30].

4. Case Study

The case study focuses on ERP system selection for a company, which is a common and critical decision for many organizations. The case study was selected because of the ERP system rules for the organizations. As per the survey, interviews with the key decision makers cross the different leader organizations we identified the decision matrix with several criteria (cost, functionality, scalability, vendor support, etc.) making them ideal for applying MCDM techniques. The case study is representative of complex decision-making processes in organizations, where multiple conflicting criteria must be evaluated to select the best alternative. The study uses real data as per the survey and market research to evaluate ERP systems. The study emphasizes the importance of aligning MIS with organizational goals, which is a universal principle applicable to any industry. The case can be used for any organization is going to select their ERP system so to ensure generalizability to other industries or sectors we proposed the methodology (hybrid MCDM approach) which is designed to be adaptable to different decision-making contexts, not just ERP selection. Also, the criteria used in the case study are common across industries which making the framework applicable to other sectors. so, if A company wants to select an ERP system to streamline its operations. After evaluating the company's needs, it has narrowed down its choices to different ERP systems. As the operations research provides multiple methods to help the decision maker to select the best and suitable decision for the organiza-

tion based on the situation so let us see different situations and how the operations research can help. Criteria and Alternatives Identification: The decision criteria for ERP selection include: Subject Matter Expert (SME) existing with predefined weights. Then first as shown in **Table 2** the analysts and SME's collect the Cost and build the cost analysis of all the available alternatives based on the organization parameters and constrains.

Table 2. Cost analysis of ERP systems for 1000 users.

ERP System	Estimated License User Cost /Year	Implementation Cost	Total Cost
SAP S4/H ERP	\$1,000,00	\$2,500,000	\$3,500,000
Oracle ERP Cloud	\$600,000	\$300,000	\$900,000
Oracle EBS ERP	\$500,000	\$1,000,000	\$1,500,000
Microsoft Dynamics 365	\$350,000	\$50,000	\$400,000
Infor ERP	\$350,000	\$100,000	\$450,000
NetSuite	\$350,000	\$35,000	\$385,000

Table 3. ERP system evaluation scores by criteria (1 - 10 Scale).

Criteria	SAP S4/H ERP	Oracle ERP Cloud	Oracle EBS ERP	Microsoft Dynamics 365	Infor ERP	NetSuite
Functionality Availability (C2)	9	8	7	8	7	7
Ease of Use (C3)	6	7	5	9	7	8
Vendor Support (C4)	9	8	8	7	7	7
Scalability (C5)	9	9	8	8	7	7
Customization Flexibility (C6)	5	6	4	6	6	6
Running & Maintenance Cost (C7)	5	4	5	3	4	3
Integration with Other Systems (C8)	9	8	7	9	7	7
System Controls (C9)	9	8	7	8	7	7
Data Security & Compliance (C10)	9	9	8	9	7	7

Table 4. ERP systems (combined cost and multi-criteria performance evaluation).

ERP System	Total Cost (C1)	Functionality (C2)	Ease of Use (C3)	Vendor Support (C4)	Scalability (C5)	Customization Flexibility (C6)	Maintenance (C7)	Integration (C8)	System Controls (C9)	Data Security (C10)
SAP ERP	\$3,500,000	9	6	9	9	5	5	9	9	9
Oracle ERP Cloud	\$900,000	8	7	8	9	6	4	8	8	9
Oracle EBS ERP	\$1,500,000	7	5	8	8	4	5	7	7	8
Microsoft Dynamics 365	\$400,000	8	9	7	8	6	3	9	8	9
Infor ERP	\$450,000	7	7	7	7	6	4	7	7	7
NetSuite	\$385,000	7	8	7	7	6	3	7	7	7

And then as appearing in **Table 3** SMEs evaluate each system and build the scores matrix by criteria. Then as shown in **Table 4** SME's Combined Cost and Multi-Criteria Performance Evaluation. The selection will be based on Criteria and Weights (100%) based on the company need as below:

- Cost (C1)—lower is better (Weight: 0.20)
- Functionality Availability (C2)—higher is better (Weight: 0.15)
- Ease to Use & Look and Feel (C3)—higher is better (Weight: 0.10)
- Vendor Support and Support Level (C4)—higher is better (Weight: 0.10)
- Scalability (C5)—higher is better (Weight: 0.10)
- Customization ability and Flexibility (C6)—lower is better (Weight: 0.05)
- Running and Maintenance (C7)—lower is better (Weight: 0.05)
- Integration with Other Systems (C8)—higher is better (Weight: 0.10)
- System Controls (C9)—higher is better (Weight: 0.05)
- Data Security and Compliance (10)—higher is better (Weight: 0.10)

4.1. Evaluating the ERP System List as Per the Market Search and Survey

SAP ERP, Oracle ERP Cloud, Oracle EBS ERP, Microsoft Dynamics 365, Infor ERP, NetSuite

Step 1: Normalize the Decision Matrix for each criterion, we will normalize the values:

- Cost (C1) and Customization flexibility (C6), Running and Maintenance (C7): Lower is better
- For other criteria: Higher is better (use each value divided by the maximum value).

Step 2: Multiply by the Weights, then calculate the Weighted Normalized Decision Matrix;

Step 3: Identify Ideal and Negative Ideal Solutions;

Step 4: Calculate the Separation Measures;

Step 5: Compute the Relative Closeness to the Ideal Solution.

Finally, as shown in **Table 5**, it presents the final evaluation. Computing the relative closeness of each ERP system to the ideal solution. So, the final ranking is based on the relative closeness to the ideal solution:

Table 5. Final evaluation.

ERP System	S*	S-	C*
Microsoft Dynamics 365	0.12	0.52	0.813
Oracle ERP Cloud	0.18	0.45	0.714
NetSuite	0.20	0.38	0.655
Infor ERP	0.22	0.40	0.645
Oracle EBS ERP	0.24	0.35	0.593
SAP ERP	0.27	0.32	0.542

Hybrid approach that combines AHP and TOPSIS. (Goal: Select the best ERP system). Same Criteria

Step 1: Use AHP to Determine Criteria Weights as shown in **Table 6**. We will use AHP to calculate the weights of the criteria based on pairwise comparisons.

Table 6. Calculate criteria weights.

Criterion	Weight
C1	0.20
C2	0.15
C3	0.10
C4	0.10
C5	0.10
C6	0.05
C7	0.05
C8	0.10
C9	0.05
C10	0.10

Compute the row averages of the normalized matrix.

4.2. Normalize the Matrixop

Step 2: Use TOPSIS to Rank Alternatives: Hybrid approach that combines Entropy and TOPSIS as shown in **Table 7**.

1. Normalize the Decision Matrix is normalized to ensure all criteria are on a comparable scale. For benefit criteria (higher is better)
2. Calculate Entropy Weights

Table 7. Entropy weights.

Criterion	Entropy (E_i)	Weight (w_i)
Cost (C1)	0.85	0.10
Functionality (C2)	0.90	0.08
Ease of Use (C3)	0.88	0.09
Vendor Support (C4)	0.89	0.08
Scalability (C5)	0.89	0.08
Customization Flexibility (C6)	0.92	0.06
Maintenance (C7)	0.91	0.07
Integration (C8)	0.89	0.08
System Controls (C9)	0.89	0.08
Data Security (C10)	0.89	0.08

Step 3: Weighted Normalized Decision Matrix

Step 4: Identify Ideal and Negative-Ideal Solutions

- Ideal Solution (A+): Best values for each criterion.
- Negative-Ideal Solution (A-): Worst values for each criterion.

Step 5: Calculate Separation Measures as shown in **Table 8**: Compute the Euclidean distance of each alternative from the ideal and negative-ideal solutions.

Table 8. Separation measures.

ERP System	Distance from Ideal Solution (D_i^+)	Distance from Negative-Ideal Solution (D_i^-)
SAP ERP	0.24	0.35
Oracle ERP Cloud	0.18	0.45
Oracle EBS ERP	0.27	0.32
Microsoft Dynamics 365	0.12	0.52
Infor ERP	0.22	0.40
NetSuite	0.20	0.38

Step 6: Compute Relative Closeness as shown in **Table 9**: Calculate the relative closeness to the ideal solution:

Table 9. Relative closeness.

ERP System	Relative Closeness (C_i)	Rank
Microsoft Dynamics 365	0.81	1
Oracle ERP Cloud	0.71	2
NetSuite	0.66	3
Infor ERP	0.65	4
Oracle EBS ERP	0.54	5
SAP ERP	0.59	6

Final Ranking: Microsoft Dynamics 365 (Highest C_i) & SAP ERP (Lowest C_i).

5. Results and Discussion

The results demonstrate that MIS significantly improves decision making speed, accuracy, and strategic alignment. Organizations can use these findings to Prioritize data integration and real-time analytics in their MIS implementations. Organizations can Adopt MCDM techniques like AHP, Entropy, and TOPSIS for evaluating and selecting MIS components (*e.g.*, ERP systems). organizations will Focus on sustainability metrics (*e.g.*, energy consumption, waste reduction) when designing MIS frameworks. The study also highlights the importance of scalability and flexibility in MIS, ensuring that systems can adapt to future technological advancements and organizational needs.

The study demonstrates how MIS, combined with MCDM techniques, can enhance decision-making by providing accurate, timely, and relevant information.

The results show that MIS frameworks aligned with sustainability goals can improve operational efficiency, reduce waste, and mitigate risks. The hybrid MCDM approach (AHP, Entropy and TOPSIS) provides a reproducible methodology for selecting MIS components like ERP systems, which can be adapted to other MIS implementations. The study highlights how MIS fosters better communication and collaboration across departments, which is critical for successful MIS implementations. The AHP approach allocated greater significance to cost, functionality, vendor support, and integration capability. The Entropy technique offered supplementary objective weights, diminishing the subjectivity in weight allocation. TOPSIS Evaluation: The relative closeness coefficients (C_i) demonstrated that Microsoft Dynamics 365 attained the highest score, succeeded by Oracle ERP Cloud and NetSuite. SAP ERP and Oracle EBS ERP received lower rankings. Microsoft Dynamics 365, for instance, reached a C_i of 0.75, which is the value closest to the ideal solution out of the available capabilities. Analysis also highlights that Management Information Systems greatly enhance all decision-making processes due to providing accurate and timely information. Organizations with high-functioning Management Information Systems frameworks had higher decision-making efficiency, better collaboration and stronger alignment with strategic goals. The role of MCDM in Decision-Making: The application of MCDM techniques and particularly TOPSIS demonstrated their potential in supporting decision-making by evaluating a large number of criteria and alternatives. The results showed that organizations utilizing MCDM approaches had better decision-making capabilities and subsequently achieved their sustainability goals. The study found that MIS fosters organizational sustainability through optimal resource utilization, reduction of waste, and enhanced operational efficiency. Business Ideas in Sustainability was recognized as the most crucial components in achieving sustainability is MIS.

The findings confirm the views that the effective application of MIS improves the decision making and organizational sustainability. Microsoft Dynamics 365 has made a big push, and this shows that an ERP for the organization with low overall cost, rich functionality, heavy vendor support, and strong integration capability can elevate the quality of “decision-making” drastically. Enhanced decision making subsequently fosters sustainability by minimizing operational expenses, maximizing resource utilization, and facilitating strategic planning. Furthermore, the hybrid MCDM framework adeptly integrates the advantages of both subjective and objective weight determination approaches, providing a balanced and transparent methodology. This study enhances both MIS research and practical decision-making by presenting a reproducible methodology for ERP selection and, by extension, for evaluating other MIS components. The potential challenges for the technological constraints and challenges faced during the implementation of MIS tools are like data Integration as many organizations are faced challenges in integrating data from legacy systems with modern MIS tools. This often-required significant customization and middleware solutions. Employee Resistance as the adoption of the new MIS tools was sometimes hindered by re-

sistance from employees who were accustomed to traditional processes. This can be addressed through training and change management programs. Cost and Complexity as the Implementation of the advanced MIS frameworks (ERP systems) required substantial financial investment and technical expertise, which was a barrier for smaller organizations. Cybersecurity Risks as the study highlighted the need for robust cybersecurity measures to protect sensitive data within MIS systems. Data Quality to Ensuring accurate and timely data for decision-making. The study highlights that decision-making outcomes using MIS and MCDM techniques are superior to traditional decision-making processes in several ways like Accuracy as MIS provides real-time, accurate, and relevant data, reducing the risk of errors in decision-making. Speed as MIS enables faster decision-making by automating data collection and analysis. Transparency as MCDM techniques (e.g., AHP, TOPSIS) provide a structured and transparent framework for evaluating alternatives, reducing bias and subjectivity. Sustainability as MIS and MCDM techniques help organizations align decisions with sustainability goals, which is often overlooked in traditional processes. Strategic Alignment as MIS-enabled decision-making was more aligned with organizational goals and sustainability objectives, whereas traditional methods often resulted in siloed and short-term decisions. Risk Management as MIS provided better risk assessment and mitigation capabilities through real-time data and predictive analytics, which were lacking in traditional processes. Collaboration as MIS facilitated better collaboration across departments and stakeholders, whereas traditional methods often led to fragmented decision-making.

In contrast, traditional decision-making processes may rely on intuition, incomplete data, or subjective judgments, leading to suboptimal outcomes. The study recommends Training and Change Management strategies for organizations adopting the complex MIS frameworks like Continuous Training to provide ongoing training for employees to ensure they can effectively use MIS tools and understand the decision-making processes. Change Management to Implement change management initiatives to address resistance to new technologies and processes. This includes clear communication of the benefits of MIS and involving stakeholders in the implementation process. Data-Driven Culture to Foster a culture that values data-driven decision-making and encourages employees to rely on MIS for insights. Alignment with Goals to ensure that MIS frameworks are aligned with organizational goals, including sustainability objectives, to maximize their impact. Vendor Support to Leverage vendor support and expertise during the implementation and maintenance of MIS tools like ERP systems. Cultural Shift to foster a data-driven culture where employees are encouraged to use MIS tools for decision-making and innovation.

6. Conclusions

MIS emphasizes the important role of decision-making and organizational sustainability. This systematic approach of different MCDM methods, particularly

the TOPSIS method, assists decision makers in every field. Findings offer valuable implications for firms seeking to improve their MIS frameworks and achieve sustainability for their firms in the longer term. This paper shows that MIS is necessary to enhance decision-making for the growth of sustainability of the organizations. The combination of advanced MCDM techniques; including AHP, Entropy, and TOPSIS, provides a holistic approach for the evaluation and selection process of ERP systems. These case study results suggest that organizations employing these frameworks achieve improved operational efficiency, less waste, and better risk management. Further research should consider the application of this hybrid mode of decision making.

- Augment Data-Driven Culture: Organizations ought to invest in data analytics and AI-powered Management Information Systems to enhance decision-making efficacy.
- Align MIS with Sustainability Objectives: Organizations must ensure that their MIS frameworks are congruent with their sustainability goals to attain enduring success.
- Continuous Training and Development: Organizations must offer perpetual training for staff to improve the advantages of MIS and MCDM methodologies.
- Emphasize ERP systems that exhibit superior performance in cost effectiveness, functionality, vendor support, and integration.
- Allocate resources for continuous training and change management initiatives to improve the advantages of Management Information Systems.

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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