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Application of ARAS Methodology in Supply Chain Performance Evaluation

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Abstract

This study examines the essential the function of performance measurement in supply chain management is to assess and improve efficiency, effectiveness, and overall productivity. It helps businesses monitor key metrics, identify bottlenecks, and improve processes for improved decision-making. By assessing performance indicators such as cost, time, quality, and service levels, organizations can improve coordination, reduce risks, and Facilitating the seamless The flow of goods and information through the supply chain (SCM) Aggregate Ratio Assessment (ARAS) method. In today's highly competitive market, businesses need to improve their supply chain capabilities to ensure fast, cost-effective and value-based product delivery. The research assesses various dimensions of supply chain performance, including environment, energy, performance categories (PC), corporate image (CI) and environmental health and safety (EHS). Using the ARAS method, the study ranks these factors, identifying energy as the top priority, followed by corporate image, environment, performance categories and environmental health and safety.

These findings emphasize the strategic importance of energy management in modern supply chains, while underscoring the increasing relevance of corporate reputation and environmental sustainability. Analysis of weighted normalized data revealed distinct trends in key performance indicators (DC, DCPTS, NDS, DSPDS). DC and DCPTS showed strong performance in the environment and energy categories, NDS excelled in the performance categories, and DSPDS led in environmental health and safety. The optimal operational values further highlight the importance of performance categories and environmental health and safety (EHS) as key drivers of supply chain success. The applied degree analysis reinforced this, with performance categories scoring highly, emphasizing its important role in supply chain evaluation, while EHS followed closely with. These findings emphasize the need for a well-rounded approach to supply chain management, integrating energy efficiency, corporate image, and environmental factors with operational performance and safety measures. This study contributes to the supply chain management literature by explaining the effectiveness of the following the ARAS method in decision making according to multiple criteria for assessing supply chain performance. The insights provided can help organizations prioritize improvement efforts and maintain competitiveness in an increasingly complex global marketplace.

Keywords: Supply Chain Management (SCM), ARAS Methodology (Additive Ratio Assessment), Performance Measurement, Sustainability Metrics, Multi-Criteria Decision Analysis (MCDA)

Introduction

To remain competitive, businesses must leverage their Supply chain (SC) capabilities and resources help deliver goods and services to market quickly at low cost, while ensuring high efficiency and reliability right features and the highest overall value (Gunasegaram et al.). Effective performance measurement is critical to SC performance. Companies can no longer focus solely on improving their internal operations while ignoring the operations of their suppliers and customers. Supply Chain Performance Measurements (SCPM) serve as key indicators of SC performance, helping businesses gain deeper insights into Improve their supply chain operations and increase overall efficiency. [1] They evaluated the forecasts and conducted A three-stage Delphi survey to assess the feasibility and impact of each forecast strategies considered most likely and most promising include improved integration, better information sharing, globalization, and strengthened collaboration. In addition, various research institutions have explored The Evolution Regarding supply chains. For example, MIT's Centre for Transportation and Logistics has been conducting a multi-year research effort on supply chain improvement developments improvements. [2] More significantly, we observed how supply chain mechanisms enabled firms to integrate strategies in ways that were previously considered unattainable. Supply chain networks provided firms with the flexibility to adopt new strategic approaches and to develop the associated structural designs to effectively implement them.

In our framework, downstream firms in the value chain could strengthen their future market strategies by leveraging the structures and processes of upstream custodians, or they could choose different strategy-structural combinations. [3]A big challenge in supply chain management is finding the right balance between demand improve customer value while reducing supply and manufacturing costs for suppliers (Christopher). Businesses that implement innovative supply chain solutions that increase customer value at low cost can quickly strengthen their competitiveness. In today's environment, rapid manufacturing technologies that enable the production of parts on demand without the need for tools or systems have

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the potential to serve as the foundation for these transformative supply chain solutions. [4]The study revealed that in quality management-related relationships, organizations can indirectly improve their time performance through the complete mediation of internal procedures involves quality management, bottom-up management, inter-unit coordination, and vertical coordination. On the other hand, in material flow management, the influence on time-related performance may be fully or partially mediated by internal procedures. [5] Supply chain transformation. For example, MIT's Centre for Transportation and Logistics has been conducting a multi-year research effort focused on improving supply chains.

They categorized the barriers into two primary categories: inter-firm competition and management complexity. Within the inter-firm competition category, the top barriers, ranked by importance, included internal and external conflicts, ineffective SCM planning, lack of strategic vision for SCM, lack of trust, insufficient management commitment, and limited understanding of SCM. [6] Supply chain evolution. For example, MIT's Transportation and Logistics Centre has been conducting a multi-year research effort research effort focused on improving supply chain operations. They categorized the barriers into two main groups: inter-firm competition and management complexity. Under the inter-firm competition category, they recognized the following barriers, ranked in order of importance: internal and external conflicts, ineffective SCM planning, lack of a strategic vision for SCM, lack of trust, insufficient management commitment, and limited understanding of SCM. [7] Most manufacturing organizations operate as networks of production and distribution facilities where raw materials are purchased, processed into intermediate and finished goods, and then delivered to customers.

These networks are managed through supply chain management (SCM). In the short term, SCM focuses on improving productivity, reducing overall inventory, and shortening total cycle time. In the long term, the goal is to improve customer satisfaction, expand Expand They recognized the following barriers, ranked in order of importance: internal and external conflicts, ineffective SCM planning, lack of a strategic vision for SCM, lack of trust, insufficient management commitment, and limited understanding of SCM including suppliers, manufacturers, distribution centres (DCs), and customers. [8]When companies in a supply chain have strong connections (SCO) and actively share valuable information about customer needs (SCM), they can gather detailed insights into customer preferences and respond effectively to their demands. In essence, market orientation (MO) directly improves company performance and also has an indirect impact across supply chain boundaries through the SCO–SCM pathway. In addition, companies engage in continuous learning by collaborating with external partners such as customers, distributors, and suppliers (Slater and Naiver)—an integral aspect of MO. [9] Over the past twenty Over the years, Supply chain management (SCM) has attracted significant attention from researchers and professionals.

It emphasizes interdependence of buyers and suppliers, fostering collaboration to improve overall supply chain performance. SCM takes a comprehensive A strategy that focuses on planning and coordinating the flow of goods, materials, services, and information from suppliers to manufacturers or service providers, and finally to the end customer. This method is a fundamental shift in business management practices. [10] Forrester Research estimates that the e-commerce market will reach [annual] trillions, a significant portion of which comes from B2B sales. The Internet streamlines business transactions such as ordering, invoicing, and payments, reducing procurement costs and shortening lead times. It also improves coordination and collaboration within individual companies and between companies. Creating efficient supply chains has long been a major focus for organizational designers. [11] Situations may differ This study, which varies from country to country, focuses specifically on the Swedish context. For example, Epstein et al. discuss Implementing decision support systems in Chile. In Sweden, supply chain planning is mainly used by industrial forestry companies, which manage vast forest resources with their own pulp and paper mills and sawmills, as well as by forest owners' associations representing private landowners. landowner's companies that also operate their own pulp and wood mills. [12] This further undermines the ability of the food system to sustain a growing population. As a result, governments and policymakers are placing greater emphasis on research aimed at developing holistic solutions to address food sustainability challenges.

As a result, stakeholders in the food sector need to expand their efforts beyond organizational boundaries to create a sustainable food supply chain. From an industry perspective, improving the sustainability of processes and products will reduce risks and enable better adaptation to changing consumer needs. [13] The dataset of Data on information-related companies were obtained from the Information Services Industry Association of the ROC and the Taiwan Electrical and Electronics Manufacturers Association. Taiwan's information-related industries play a significant role in the global IT value chain. To maintain their competitiveness and market leadership, Taiwanese companies acknowledge the important role of supply chain management (SCM). This enables them to closely cooperate with major global IT companies such as Dell, Intel, and Apple contributing to the development of innovative IT products and services.[14]Supply chain management (SCM), which involves designing and operating efficient manufacturing and logistics networks and managing the internal and external processes of supply, transformation, and distribution, has become a key Competitive advantage (Cooper et al.; Meltzer et al.). Likewise, sustainability plays a key role, emphasizing the integration of economic, social, and environmental factors to achieve three main goals (TBL), has increased significantly over the past few decades. [15]

Materials and Method

Environment: The environment encompasses the complete set of both living and non-living elements affect human life. Living elements include animals, plants, forests, fisheries, and birds, while non-living elements include water, land, sunlight, rocks, and air.

Energy: Scientists define energy as the ability to do work. The progress of modern civilization has been driven by humanity's ability to convert energy from one form to another and use it for various purposes.

Product/consumers: This article designed for educational for informational purposes only and should not be construed as legal, employment, or health and safety advice. It is best to seek guidance from a qualified professional appropriate to your business. Consumer refers to a person who uses a product or service.

Community involvement: Community engagement has the potential to create meaningful, measurable improvements within the communities you serve and for your business. Examples of community engagement include financial and in-kind donations, employee volunteer efforts, skills-based volunteer programs, long-term partnerships with non-profits, and more.

Employee health and safety: Employee safety involves creating a safe work environment by implementing safe equipment and procedures to protect workers and ensure their well-being.

Disclosing companies: Companies must promptly disclose relevant information that investors can consider when making informed investment decisions. This includes events related to the company's operations or any factors that may affect the value of the stock.

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Disclosing companies as a percentage of total sample: For example, the Environmental Responsibility Disclosure Assessment Report on Chinese Listed Companies.

Number of disclosed Sentences: She refused to reveal any details of the scheme. She received an anonymous letter warning her that details of her affair would be revealed if she did not pay. This information could not be shared without the minister's approval. They reached an agreement to keep all details confidential.

Disclosed sentences as a percentage of all disclosed sentences: Verb He declined to reveal the source of his information. The company has announced that it will lay off thousands of workers by the end of this year. The identity of the victim has not yet been made public.

ARAS method: A new ARAS This method is used to rank alternatives and identify the most suitable option. In a standard multi-criterionina multi-criterion decision-making (MCDM) problem, the objective is to rank a limited set of decision alternatives by evaluating multiple criteria simultaneously. The ARAS method establishes that the utility function value, which represents the overall relative performance of an alternative, is directly affected by the assigned values and weights of the key project criteria. [16] When evaluating e-commerce websites, there are its own unique considerations for evaluating author websites. Therefore, in this paper, we discuss the criteria for measuring website quality as identified by Kaprun. In the following in this section, we introduce the basic elements of the ARAS method are outlined. Then, a numerical example is given to illustrate the application of the ARAS method in estimating and measuring quality of an author website. [17] Recruitment and selection of employees play a vital role in human resource management. The need for recruitment arises when a position becomes available or a new position is required due to organizational growth. Before starting the recruitment process, a job analysis should be conducted to ensure a clear definition of the position.

Although the ARAS method is a relatively recent approach, it is effective and user-friendly in multi-criteria decision making (MCDM). Its efficiency and applicability are strengthened by various extensions, such as the ARAS-G method (Tarski's & Zavadskas) that includes Gary numbers and another extension that uses interval-valued triangular fuzzy numbers. [18]To identify and to identify the most suitable alternative, complex AHP and ARAS methods were used. The AHP method was used to assess the importance expert ratings, while the ARAS method was used to select the alternative with the highest utility based on the selected criteria and their relative importance. The integration of these methods helped to assess the attitudes of cultural heritage experts, public representatives and investors towards each selected building [19]. The proposed method is used to identify the most suitable freight distribution concept for a tire manufacturing company in the Czech Republic. It takes into account the criteria, sub-criteria, and expert evaluations of various freight distribution alternatives, and uses picture fuzzy sets (PFSs) to improve accuracy and reduce information loss. A comparative analysis is conducted using nine advanced picture fuzzy MCDM methods to validate the newly developed picture fuzzy ARAS method. [20] They developed an effective decision-making tool using image fuzzy sets Combined with the ARAS method, various studies have explored its application in various domains.

Tarski et al. combined the AHP and gravy ARAS methods to rank built heritage projects, while Put et al. used The proposed method is used to determine the most suitable freight distribution concept for a tire manufacturing company in the Czech Republic. It considers the criteria, sub-criteria, and expert assessments of various freight distribution alternatives.[21] One of the key factors in ensuring that management activities run smoothly is maintaining stable cash flow. While management can take precautionary measures within the company and intervene directly when necessary in Production quality, sales potential and raw material procurement costs are important factors, and Even a minor issue during the collection period, often influenced by external factors, can interfere with future operations planning and affect cash flow. Maintaining cash flow on an ongoing basis is crucial for management to develop sound, forward-thinking plans. [22]Choosing an appropriate testing method is very important, especially in terms The final result and outcome depend on effective decision making. This research paper highlights that multi-criteria decision making can be successful in selecting software testing methods. In particular, the ARAS method is straightforward to use and improves the efficiency and practicality of the proposed approach. [23]In the human resource management literature, employee selection criteria are generally classified There are two primary types: (1) task analysis and (2) competency-based approach. Considering the strengths and weaknesses of these methods, which are explored in the following sections, this study uses a competency-based approach to selecting information technology (IT) employees. It uses a hybrid gravy mix ratio assessment–hierarchical weighted rating ratio analysis (ARAS-SWARA) method. [24] This study uses Interval type-2 fuzzy sets (IT2FS) are used to effectively handle uncertainty. A new hybrid ranking model that integrates the FRPR concept with the ARAS method within the IT2FS framework is introduced. The FRPR approach reduces the time complexity by integrating all the fuzzy numbers relying on averages in decision-making problems. By eliminating the need for pairwise comparisons, this innovative FRPR method significantly streamlines the decision-making process.[25] This manuscript aims to develop Focusing on the role of sales manager in the hospitality industry, a robust multi-criterion decision-making (MCDM) model has been developed for employee selection.

This model incorporates the SWARA method to improve decision-making efficiencyto establish the weights of the evaluation criteria, in this context, the ARAS method is used rank the candidates against the alternatives in the selection process. [26] ARAS struggles to deal with uncertainty that arises from ambiguity, subjective judgments, incomplete information, and lack of clear data or inaccuracies in understanding. Failure to account for these factors can lead to Inaccurate estimates. The advantage One of the main advantages of fuzzy logic is its ability to handle uncertainty, making it a practical approach to managing complex and unpredictable situations. [27] In addition, it helps to consider both Considering Performance measurement considers both inputs and outputs simultaneously. Recognizing these advantages, Barak and Haidari Dalhousie proposed combining DEA with MADM methods to overcome their limitations while enhancing their strengths. Based on this approach, the present study uses a combination of fuzzy DEA and fuzzy ARAS methods to develop a research framework. [28] Although previous extensions have significantly expanded the scope of decision problems that ARAS methods can effectively solve, the addition of interval-valued fuzzy numbers will further improve their applicability. Therefore, this study introduces an extended ARAS method that incorporates Space-valued triangular fuzzy numbers. To demonstrate the applicability of these improvements, an example evaluating a faculty website is also provided. [29] It only reflects the historical performance of the company, which Due to different accounting practices, management practices and yield results that are not comparable across companies can be affected. When relying on accounting-based measures, it is also necessary to consider the unique characteristics and risks associated with different industries. To overcome these limitations, you can use stock market-based indicators assess a company's financial performance advantage of these measures is that they are less affected by the different accounting practices and management manipulations used by companies [30].

Materials and Method

Table. 1 Supply chain management				
	DC	DCPTS	NDS	DSPDS
Environment	34.65	267.74	49.32	25.37
Energy	76.92	264.98	25.54	92.15
PC	38.90	647.29	11.43	43.21
CI	14.47	869.45	67.54	67.94
EHS	73.81	793.12	86.25	12.54

This table provides an assessment of supply chain management using the ARAS methodology, assessing performance across various criteria: DC, DCPTS, NDS and DSPDS. The environmental data shows a significant gap, with DC leading with a score of 34.65 and DCPTS with a score of 267.74, highlighting the differences in sustainability. DCPTS excels in energy efficiency with a score of 264.98, while NDS lags behind with a score of 25.54. Differences are evident in Performance Categories (PC) and Corporate Image (CI), where DCPTS leads (647.29 and 869.45, respectively). Conversely, DSPDS falls short in EHS with a score of 12.54. This analysis highlights the importance of adopting balanced approaches to sustainability, energy and corporate image supply chain management.

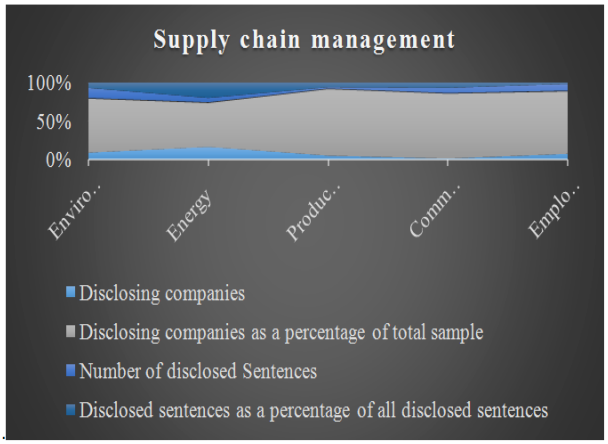

Figure 1: Assesses supply chain management performance across four criteria

Figure 1 Assesses supply chain management performance across four criteria: DC, DCPTS, NDS, and DSPDS. DCPTS consistently outperforms the others, particularly in Corporate Image (CI) with a score of 869.45 and Environmental Health and Safety (EHS) with a score of 793.12, reflecting its strong emphasis on sustainability and safety. In contrast, NDS performs poorly, particularly in Performance Categories (PC) and Energy Efficiency, indicating areas for improvement.

Table 2: Outlines the weighted performance indicators (Wij) using the ARAS methodology				
Wij	0.25	0.25	0.25	0.25
	DC	DCPTS	NDS	DSPDS
Environment	31.08	142.97	0.02028	0.03942
Energy	31.08	139.53	0.03915	0.01085
PC	29.12	142.97	0.08749	0.02314
CI	24.08	122.58	0.01481	0.01472
EHS	23.17	128.28	0.01159	0.07974

Table 2 outlines the weighted performance indicators (Wij) using the ARAS methodology, assessing the criteria across the environmental, energy, performance categories (PC), corporate image (CI), and EHS factors – DC, DCPTS, NDS, and DSPDS. The Wij values are set uniformly at 0.25, indicating equal weighting for each factor. DC and DCPTS perform significantly better than the others, especially in the environmental and energy categories (31.08 and 142.97, respectively). Meanwhile, NDS and DSPDS show the lowest scores, especially in PC and CI. This indicates that while DC and DCPTS are leading in sustainability and performance, NDS and DSPDS require significant improvements in environmental and energy efforts.

Table 3: Presents normalized data for the ARAS method				
	Normalized Data			
Environment	0.2244	0.2114	0.1170	0.2348
Energy	0.2244	0.2063	0.2259	0.0646
PC	0.2102	0.2114	0.5048	0.1379
CI	0.1738	0.1812	0.0854	0.0877
EHS	0.1673	0.1897	0.0669	0.4750

Table 3 presents normalized data for the ARAS method, which illustrates the relative performance of the four criteria – DC, DCPTS, NDS, and DSPDS – across various factors. DC and DCPTS lead in environmental and energy performance, with DC scoring 0.2244 and 0.2114, and DCPTS scoring 0.2114 and 0.2063. NDS performs best in performance categories (PC) with a score of 0.5048, while DSPDS excels in environmental health and safety (EHS) with a score of 0.4750. The normalized data reveals significant differences between the criteria, highlighting that DC and DCPTS have a more balanced focus on sustainability, while NDS and DSPDS require improvements, particularly in energy and environmental factors.

Table 4: Presents the weighted normalized data.				
	Normalized weighted data			
Environment	0.0561	0.0528	0.0292	0.0587
Energy	0.0561	0.0516	0.0565	0.0162
PC	0.0526	0.0528	0.1262	0.0345
CI	0.0435	0.0453	0.0214	0.0219
EHS	0.0418	0.0474	0.0167	0.1188

Table 4 shows the weighted normalized data assessing the performance of DC, DCPTS, NDS and DSPDS on various factors, based on the ARAS method. DC and DCPTS perform strongly, especially in the environment and energy categories, with weighted values of 0.0561 and 0.0528 for environment and 0.0561 and 0.0516 for energy. NDS leads in the performance categories (PC) with a higher weight of 0.1262, while DSPDS stands out in the environmental health and safety (EHS) category with a score of 0.1188. These weighted values highlight distinct strengths and weaknesses, with DC and DCPTS showing strong overall performance, while NDS and DSPDS have areas for improvement.

Table 5: Shows the optimal function \ (Sk \).	
	optimality function Si
Environment	0.1969

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Energy	0.1803
PC	0.2661
CI	0.1320
EHS	0.2247

Table 5 gives the optimization function \(Si \), whichARAS method assesses the overall performance of supply chain management criteria. The highest score, 0.2661, is found in the Performance Category (PC), indicating its importance in the assessment performance assessment. Environmental Health and Safety (EHS) follows closely with a value of 0.2247, which highlights its importance. Environment and Energy have significant scores of 0.1969 and 0.1803, respectively. Corporate Image (CI) has the lowest value at 0.1320, indicating the lowest priority in the assessment. These values underline the focus on efficiency and sustainability within the supply chain.

Table 6: presents the utility scale \ (Ki \)	
	utility degree K_i
Environment	0.739991495
Energy	0.67767673
PC	1
CI	0.496289944
EHS	0.844589879

Table 6 presents the utility degree Ki, which measures the relative importance of each factor in supply chain management according to the ARAS method. Performance category (PC) has the highest utility degree of 1, indicating its important role in the evaluation process. EHS comes next with a value of 0.8446, highlighting its importance in environmental health and safety. The utility degrees for environment and energy are 0.73999 and 0.6777, respectively, indicating their significant contribution to the overall evaluation. Corporate image (CI) has the lowest utility degree of 0.4963, indicating that it is less emphasized compared to other factors.

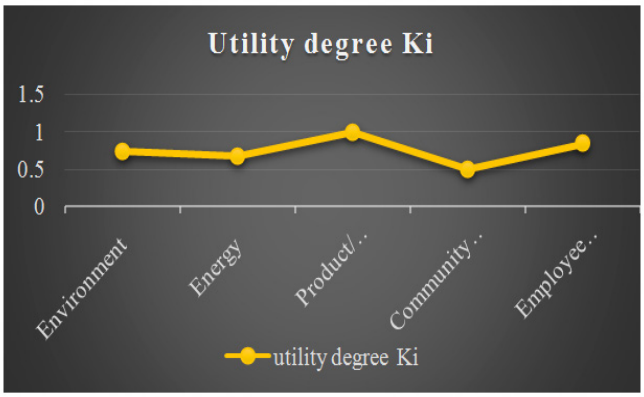

Figure 2: Utility degree Ki

Figure 2 shows the utility degree (Ki) for various factors in supply chain management according to the ARAS method. Performance Category (PC) leads with the highest utility degree of 1, followed by EHS at 0.8446, highlighting their important roles. Environment and Energy are important, while Corporate Image (CI) has the lowest value.

Table 7: Ranks the factors in supply chain management according to the ARAS method	
	Rank
Environment	3
Energy	1
PC	4
CI	2
EHS	5

Table 7 ranks the factors in supply chain management according to the ARAS method. Energy ranks first, highlighting its central role in the assessment. Corporate image (CI) ranks second, emphasizing its importance in decision-making. Environment ranks third, showing its significant but secondary position. Performance category (PC) ranks fourth, indicating that it is important but not as prioritized as energy and CI. EHS ranks fifth, indicating that, although important, it is less important in the current assessment and may require less immediate attention for improvement.

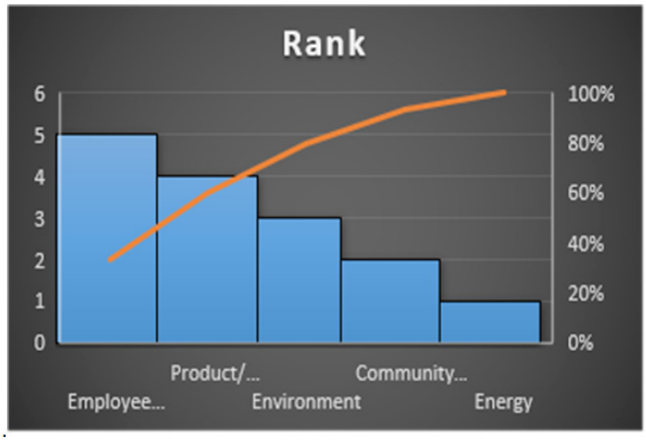

Figure 3: Rank

Figure 3 illustrates the ranking of supply chain management factors according to the ARAS method. Energy is ranked first, followed by Corporate Image (CI) in second place, which highlights their importance. Environment comes in third place, Performance Category (PC) and EHS are in fourth and fifth place respectively, which indicates that they have a relatively low priority.

Conclusion

The study provides key insights into supply chain management performance across multiple dimensions. Energy emerged as the most important factor, highlighting its critical role in modern supply chain operations. This underscores the need for organizations to prioritize energy efficiency and management to improve competitiveness and sustainability. Corporate Image (CI) ranked second, highlighting the increasing importance of reputation and brand awareness in supply chain operations. This reflects the growing awareness among stakeholders about corporate responsibility and transparency. Despite increasing sustainability concerns, environment ranked third, indicating its significant influence. The ARAS methodology identified significant

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trends in the weighted normalized data. DC and DCPTS exhibited strong performance in the environmental and energy categories with weighted values of 0.0561 and 0.0528, respectively. NDS showed particular strength in performance categories (PC) with a weight of 0.1262, while DSPDS excelled in environmental health and safety (EHS) with a score of 0.1188. The optimality function (Si) values provided additional insights, with the performance category scoring the highest at 0.2661, followed by EHS at 0.2247.

These scores indicate that operational efficiency and safety are fundamental to supply chain success. The utility degree (Ki) analysis further reinforced these findings, showing a perfect score of PC 1, followed by EHS at 0.8446. However, the study also identified areas that needed attention. The relatively low rankings of performance category (PC) and environmental health and safety (EHS) at fourth and fifth place, respectively, indicate potential gaps that need to be addressed in these areas. This represents an opportunity for companies to strengthen their performance metrics and safety protocols within their supply chain operations. The findings emphasize the need for a balanced approach to supply chain management in which energy efficiency, corporate image, and environmental considerations are harmoniously integrated with operational efficiency and safety measures. Companies should focus on developing comprehensive strategies that address all of these factors while prioritizing energy management and corporate image improvement. In the future, companies should consider implementing integrated approaches that can improve their performance across all measured dimensions, especially focusing on strengthening their lower-ranking aspects while maintaining their strong performance in energy management and corporate image.

Reference

1. Kurien, Georgy P., and Muhammad N. Qureshi. “Study of performance measurement practices in supply chain management.” International Journal of Business, Management and Social Sciences 2, no. 4 (2011): 19-34.

2. Melnyk, Steven A., Rhonda R. Lummus, Robert J. Vokurka, Laird J. Burns, and Joe Sandor. “Mapping the future of supply chain management: A Delphi study.” International journal of production Research 47, no. 16 (2009): 4629-4653.

3. Miles, Raymond E., and Charles C. Snow. “Organization theory and supply chain management: An evolving research perspective.” Journal of operations management 25, no. 2 (2007): 459-463.

4. Walter, Manfred, Jan Holmström, and Hannu Yrjölä. “Rapid manufacturing and its impact on supply chain management.” In proceedings of the logistics research network annual conference, vol. 12. 2004.

5. Casadesús, Martí, and Rodolfo de Castro. “How improving quality improves supply chain management: empirical study.” The TQM magazine 17, no. 4 (2005): 345-357.

6. Mittapally R (2024). Intelligent Framework Selection: Leveraging MCDM in Web Technology Decisions. J Comp Sci Appl Inform Technol. 9(1): 1-9.

7. Shukla, Rajendra Kumar, Dixit Garg, and Ashish Agarwal. “Understanding of supply chain: A literature review.” International Journal of Engineering Science and Technology 3, no. 3 (2011): 2059-2072.

8. Barnes, Jane, and Ying Liao. “The effect of individual, network, and collaborative competencies on the supply chain management system.” International journal of production economics 140, no. 2 (2012): 888-899.

9. Lee, Eon-Kyung, Sungdo Ha, and Sheung-Kown Kim. “Supplier selection and management system considering relationships in supply chain management.” IEEE transactions on Engineering Management 48, no. 3 (2001): 307-318.

10. Min, Soonhong, John T. Mentzer, and Robert T. Ladd. “A market orientation in supply chain management.” Journal of the academy of marketing science 35 (2007): 507-522.

11. Ivanov, Dmitry, Suresh Sethi, Alexandre Dolgui, and Boris Sokolov. “A survey on control theory applications to operational systems, supply chain management, and Industry 4.0.” Annual Reviews in Control 46 (2018): 134-147.

12. Attaran, Mohsen, and Sharmin Attaran. “Collaborative supply chain management: the most promising practice for building efficient and sustainable supply chains.” Business process management journal 13, no. 3 (2007): 390-404.

13. Nagababu. K, “Machine Learning Approaches to Predict Tensile Strength in Nanocomposite Materials a Comparative Analysis” Journal of Artificial intelligence and Machine Learning., 2024, vol. 2, no. 1, pp. 1–16. doi: http://dx.doi.org/10.55124/jaim.v2i1.255

14. Carlsson, Dick, and Mikael Rönnqvist. “Supply chain management in forestry—case studies at Södra Cell AB.” European Journal of Operational Research 163, no. 3 (2005): 589-616.

15. Li, Dong, Xiaojun Wang, Hing Kai Chan, and Riccardo Manzini. “Sustainable food supply chain management.” International Journal of Production Economics 152 (2014): 1-8.

16. Ou, Chin S., Fang C. Liu, Yu C. Hung, and David C. Yen. “A structural model of supply chain management on firm performance.” International Journal of Operations & Production Management 30, no. 5 (2010): 526-545.

17. Brandenburg, Marcus, and Tobias Rebs. “Sustainable supply chain management: A modeling perspective.” Annals of Operations Research 229 (2015): 213-252.

18. Zavadskas, Edmundas Kazimieras, Zenonas Turskis, and Tatjana Vilutiene. “Multiple criteria analysis of foundation instalment alternatives by applying Additive Ratio Assessment (ARAS) method.” Archives of civil and mechanical engineering 10, no. 3 (2010): 123-141.

19. Stanujkic, Dragisa, and Rodoljub Jovanovic. “Measuring a quality of faculty website using ARAS method.” In Proceeding of the International Scientific Conference Contemporary Issues in Business, Management and Education, vol. 545, p. 554. 2012.

20. Karabašević, Darjan, Dragiša Stanujkić, and Snežana Urošević. “The MCDM Model for Personnel Selection Based on SWARA and ARAS Methods.” Management (1820-0222) 20, no. 77 (2015).

21. Kutut, Vladislavas, Edmundas Kazimieras Zavadskas, and Marius Lazauskas. “Assessment of priority alternatives for preservation of historic buildings using model based on ARAS and AHP methods.” Archives of civil and mechanical engineering 14 (2014): 287-294.

22. Jovčić, Stefan, Vladimir Simić, Petr Průša, and Momčilo Dobrodolac. “Picture fuzzy ARAS method for freight distribution concept selection.” Symmetry 12, no. 7 (2020): 1062.

23. Bošković, Sara, Vesna Radonjić-Djogatović, Predrag Ralević, Momčilo Dobrodolac, and Stefan Jovčić. “SELECTION OF MOBILE NETWORK OPERATOR USING THE CRITIC-ARAS METHOD.” International Journal for Traffic & Transport Engineering 11, no. 1 (2021).

24. Özbek, Aşir, and Emel Erol. “Ranking of factoring companies in

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accordance with ARAS and COPRAS methods." International Journal of Academic Research in Accounting, Finance and Management Sciences 7, no. 2 (2017): 105-116.

25. Karabašević, Darjan M., Mlađan V. Maksimović, Dragiša M. Stanujkić, Goran B. Jocić, and Dušan P. Rajčević. "Selection of software testing method by using ARAS method." Tehnika 73, no. 5 (2018): 724-729.

26. Heidary Dahooie, Jalil, Elham Beheshti Jazan Abadi, Amir Salar Vanaki, and Hamid Reza Firoozfar. "Competencybased IT personnel selection using a hybrid SWARA and ARAS G methodology." Human Factors and Ergonomics in Manufacturing & Service Industries 28, no. 1 (2018): 5-16.

27. Suresh, S., M. Ramachandran, and Sathiyaraj Chinnasamy. "Evaluation of Unreliable Retrial G-queue Using Fuzzy ARAS Method." Data Analytics and Artificial Intelligence 2, no. 2 (2022): 97-108.

28. Dorfeshan, Yahya, Seyed Meysam Mousavi, Edmundas Kazimieras Zavadskas, and Jurgita Antucheviciene. "A new enhanced ARAS method for critical path selection of engineering projects with interval type-2 fuzzy sets." International Journal of Information Technology & Decision Making 20, no. 01 (2021): 37-65.

29. Stanujkic, Dragisa, Bojan Djordjevic, and Darjan Karabasevic. "Selection of candidates in the process of recruitment and selection of personnel based on the SWARA and ARAS methods." Quaestus multidisciplinary research journal 7 (2015): 53-64.

30. Chinnasami Sivaji, M. Ramachandran, Vimala Saravanan, and Ramya Sharma. "The Applications of Nanotechnologies in Food Science using the ARAS Method." Journal on Applied and Chemical Physics 3 (2024): 1.

31. Heidary Dahooie, Jalil, Mehrdad Estiri, Edmundas Kazimieras Zavadskas, and Zeshui Xu. "A novel hybrid fuzzy DEA-fuzzy ARAS method for prioritizing high-performance innovation-oriented human resource practices in high tech SME's." International Journal of Fuzzy Systems 24, no. 2 (2022): 883-908.

32. Stanujkic, Dragisa. "Extension of the ARAS method for decision-making problems with interval-valued triangular fuzzy numbers." Informatica 26, no. 2 (2015): 335-355.

33. Aras, Güler, Aslı Aybars, and Ozlem Kutlu. "Managing corporate performance: Investigating the relationship between corporate social responsibility and financial performance in emerging markets." International Journal of productivity and Performance management 59, no. 3 (2010): 229-254.

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