EVALUATING THE SUCCESS FACTORS FOR KNOWLEDGE MANAGEMENT IN THE FINANCIAL SECTOR: AN AHP-DEMATEL APPROACH

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ABSTRACT

The objective of this article is to identify and understand the success factors of knowledge management within the financial sector. In the ever-evolving business environment, effective knowledge management (KM) is imperative to maintain a competitive advantage. Effective KM within financial institutions can build standardized processes, ensure speedy delivery, and foster better customer relationship management. An integrated approach of the Analytical Hierarchy Process (AHP) and the Decision-Making Trial and Evaluation Laboratory (DEMATEL) methods was used to rank these critical success factors and understand their interrelationships. The findings identify organizational factors (cultural aspects, organizational structure, top management support), technological factors (technological adoption, infrastructure support, collaborative systems), and human resources factors (training & learning, agile workforce, knowledge sharing) as the critical success factors. Technological factors were identified as the most important factors. The article further complements the findings of the AHP by exploring the interrelationships between the identified factors to understand and prioritize possible intervention areas. This research has significant theoretical and practical implications. The findings can help financial institutions implement and manage knowledge management initiatives within the organization. This study also adds to the extant literature and addresses gaps in the research in the context of KM within the financial sector.

Keywords: AHP; DEMATEL; knowledge management; financial sector

1. Introduction

Knowledge incorporates the acquisition of facts, information, and skills gained through experience. It enables innovative thinking, effective processing of accessible information, and competent performance (Uit Beijerse, 2000). In today's information economy,

organizations have a broader capacity to access and store data coming from various resources and thus require efficient management, integration, and differentiation of valuable information and knowledge (Barley et al., 2018). Knowledge management (KM) involves the systemic creation, acquisition, sharing, and utilization of knowledge for the benefit of an organization (Gao et al., 2018). An organization's information assets must be identified, captured, evaluated, retrieved, and distributed using a comprehensive KM approach. Possible approaches include records, papers, guidelines, and the knowledge and experience amassed by individuals over time (Alavi & Leidner, 2001; Srinivasan, 2022). KM is integral to an organization's success as it helps efficiently utilize their collective knowledge (Almuayad et al., 2024). The availability and accessibility of enormous amounts of information encourage companies to explore KM to maintain their competitive edge (Cham et al., 2016).

The financial sector, comprised of banks, insurance companies, and other asset management companies, significantly contributes to a country's economic development. Edeh et al. (2022) highlight that KM strengthens the innovation capacity of service organizations like the financial sector. Extant literature underscores that within the financial industry KM practices have a significant positive impact on digital financial innovation (Al-Dmour et al., 2021), organizational effectiveness (Tayal et al., 2022), and organizational innovation capacity (Iqbal et al., 2021). By implementing KM practices, financial companies can improve decision-making among employees by giving them access to timely information (Pisoni et al., 2023). In addition to these outlined benefits, rapid technological advancements and evolving market dynamics necessitate that financial organizations adopt and integrate robust KM practices. This requires a better understanding of how KM practices can be implemented and integrated successfully within organizations.

Fostering robust KM practices depends on identifying success factors, prioritizing their importance, and understanding them better for successful implementation. However, despite its significance, the extant literature is focused on investigating the impact of KM practices (Al-Dmour et al., 2021; Almuayad et al., 2024; Iqbal et al., 2021) and has made a limited contribution to exploring and understanding the success factors of KM practices, especially in the context financial institutions. This study aims to address this research gap by investigating the following research objectives:

1. To identify factors which contribute to knowledge management's success in the financial sector.
2. To compare and rank the identified success factors in terms of importance.
3. To investigate the cause-and-effect relationships among these identified factors.

This study identifies and assesses the nine success factors (SFs) that are essential for initiating, implementing, and sustaining knowledge management practices within the financial sector. An inductive approach was employed to identify these SFs. Initially, existing literature on KM was examined to understand its main challenges and facilitators. Considering that the nature of a product or service can influence the design and adoption of processes, experts in the financial sector reviewed the identified factors to tailor them specifically for the industry. The critical success factors were analyzed using the Analytical Hierarchy Process (AHP) (Saaty, 2013) and the Decision-Making

Trial and Evaluation Laboratory (DEMATEL) method (Gabus & Fontela, 1972) with input from industry experts.

The AHP results highlighted the importance of technological factors like collaborative systems and infrastructure support in building robust KM practices within organizations. Additionally, the results from the DEMATEL analysis highlighted top management support and cultural aspects within the organization as significant causal factors that need to be focused on to ensure other factors' success. This article adds significant theoretical value to the research domain by addressing the literature gap. The findings will enable managers to form appropriate strategies to implement or improve KM within their organizations. As this research area has been scarcely explored in the extant literature, the findings highlighted in this study make novel contributions to the successful integration of KM in the financial sector.

2. Literature review

2.1 Understanding knowledge management

The conception of knowledge is complex, and debates about its origin persist in epistemology. Knowledge is a dynamic human resource that justifies personal beliefs to attain truth. It also involves complex cognitive processes. Knowledge, categorized into tacit and explicit forms, is an intangible asset that provides a framework for creating and using information (Gao et al., 2018). Knowledge usage is vital, requiring continuous innovation and intertwining with processes like acquisition, sharing, and codification to positively influence outcomes (Zhou & Li, 2012).

KM is crucial for organizational innovation (Erena et al., 2023). The knowledge-sharing culture within an organization significantly develops employee competency during the onboarding period (Cheikh-Ammar et al., 2024). KM strategies influence intellectual capital (Giampaoli et al., 2024), help companies develop effective risk management strategies (Manab & Aziz, 2019), optimize business performance, and result in competitive advantage (Ramos Cordeiro et al., 2024). A company's capacity to absorb customer knowledge and transform it into innovation hinges on its internal capability to continually enhance their capacity and become adept at generating customer-driven innovation (Nuruzzaman & Singh, 2019). The review of extant literature provides insights into the different aspects of knowledge and KM and establishes the importance of KM processes. It underscores the need for focused research to successfully integrate KM in organizations to make them more agile and effective.

2.2 Success factors of knowledge management

Extant literature on the critical success factors of KM in organizations highlights leadership commitment, organizational culture, and IT infrastructure as significant factors. Alazmi and Zairi (2023) accentuated top management commitment, KM strategy, KM processes, KM infrastructure, and culture as the critical success factors. Yew Wong (2005) proposed factors such as management leadership and support, culture, IT, strategy and purpose, organizational infrastructure, training, human resources, measurement measures, process and activities, and incentive systems to implement KM in SMEs. Akhavan et al. (2006) proposed knowledge strategy, training programs, CEO support and commitment, business process reengineering, network of experts, knowledge sharing,

organizational culture, knowledge storage, knowledge audit, and knowledge architecture as the critical drivers of KM. Kumar et al. (2015) highlighted that top management leadership and support, resources, infrastructure and facilities, use of internet and information technologies for effective communication, focus on KM training and education, human resource management, and knowledgeable workers drive the KM processes and practices. Aligned with the previous findings, Ghasemi and Valmohammadi (2023) emphasized that the organization's human resource management, leadership commitment, and intellectual capital are key KM implementation factors. Emphasizing the role of leadership, Farooq and Tripathi (2024) stressed the positive impact of leader-leader exchange on knowledge sharing within an organization. In addition, Mousavizade and Shakibazad (2019) also emphasized the role of setting the right KM strategy as a significant driver for KM implementation.

2.3 Knowledge management in the financial sector

Knowledge management is a significant approach to building and optimizing an organization's knowledge ecosystem. Financial service organizations such as banks, insurance companies, wealth management firms, and others are governed by regulations to ensure better customer-centric delivery of products and services. This necessitates the standardization of processes and the need for better adaptability in an uncertain business landscape. Hence, companies in the financial sector need to ensure robust infrastructure and technology to implement as well as scale KM and data-driven decision-making. This includes building data storage and management systems, data analytics tools, and data visualization software (Pisoni et al., 2023) for better data and information access, storage, and sharing. KM and its dimensions, like knowledge creation, storage, and sharing, have been found to have a profound impact on the organizational effectiveness of banks (Sadq et al., 2020). Castrogiovanni et al. (2016) analyzed the knowledge sources in the financial sector to focus on and enhance the sources that significantly impact knowledge management and acquisition. Their findings established that human resources, followed by technology adoption and the business environment, are primary sources impacting KM. In the same context, Abazeed (2020) emphasized building strategic capabilities to enhance KM capabilities.

Based on the review of available literature, as well as suggestions from experienced professionals from the financial sector, three major factors and nine sub-factors were identified in this study which are able to drive the management and sustaining of a successful knowledge management system in the financial sector organizations (Table 1).

Table 1
Identified success factors of KM in the financial sector

Success Factors	Sub-factors	References
Organizational Factors (OF)	Cultural Aspects (CA)	Abubakar et al. (2019); Alazmi & Zairi (2003)
	Organizational Structure (OS)	Abubakar et al. (2019); Castrogiovanni et al. (2016)
	Top Management Support (TMS)	Kumar et al. (2015); Akhavan et al. (2006)
Technological Factors (TF)	Technological Adoption (TA)	Castrogiovanni et al. (2016); Gold et al. (2001)
	Infrastructure Support (IS)	Alazmi & Zairi (2003); Yew Wong (2005)
	Collaborative Systems (CS)	Expert Suggestion
Human Resources Factors (HRF)	Training & Learning (TL)	Lee & Choi (2003)
	Agile workforce (AW)	Expert Suggestion
	Knowledge Sharing (KS)	Akhavan et al. (2006)

3. Methodology

Multicriteria decision-making (MCDM) techniques enable researchers and practitioners to make decisions in complex decision-making situations. These techniques have been progressively used in various contexts and applications, such as ranking and prioritization and understanding the complex relationships within a network. Among these MCDM techniques, the hybrid approach of the AHP-DEMATEL methodology is used in scenarios where multiple criteria and alternatives are to be considered to achieve a primary objective, and an in-depth understanding of the interlinkages is needed. The application of this approach is pervasive and has been increasingly used in diverse contexts, as summarized in Table 2. Although the compilation is not exhaustive, it highlights the broad application of this integrated approach across diverse areas.

Table 2
Applications of hybrid AHP-DEMATEL approach

Domain	**Application**	**References**
Healthcare	To understand the critical factors of a smart healthcare supply chain	Hossain & Thakur (2020)
	For the selection of the best alternative (allied hospital) in outpatient service	Ortíz et al. (2016)
Manufacturing & Allied	To understand and evaluate the criteria in the auto spare parts industry	Wu & Tsai (2012)
Banking	To evaluate success factors of the quality of e-services	Agrawal et al. (2022)
Supply Chain	Supplier assessment for the food supply chain	Ortiz-Barrios et al. (2020)
	To evaluate the barriers to circular supply chain implementation	Lahane & Kant (2021)
	To make a procurement decision-making model for supplier selection optimization	Kumar et al. (2018)
Others	To create a factor index system to analyze the unsafe state of coal mine practitioners	Chen et al. (2022)
	To identify and assess the risk during a flooding disaster	Zheng et al. (2022)

This hybrid approach complements the strengths of both the AHP and DEMATEL methods. While AHP helps in prioritization, DEMATEL can further build understanding by exploring the intricate nature of identified elements and identifying them in cause-and-effect groups to help build further strategic focus. As highlighted in Table 2, Agrawal et al. (2022) established the applicability of this approach in the banking sector and hence vindicate its usage in the context of identifying success factors of knowledge management in the financial industry. Sections 3.1 and 3.2 further explain the AHP and DEMATEL methodology in detail.

3.1 Analytic Hierarchy Process

Research using the AHP methodology has significantly increased in the last two decades. Though it is significantly concentrated in the engineering and technology domain (Khan & Ali, 2020), it is widely used across domains and contexts owing to its simplicity of usage and robustness in results (Al-Harbi, 2001). The AHP methodology is based on a pairwise comparison of the identified factors, and analysis, hierarchy, and process are the significant operation steps. In the analysis phase, problems are understood and defined in terms of their related elements. In the hierarchy stage, levels of criteria and sub-criteria are organized, while the weights after pairwise comparison are assigned in the process stage (Pradhan et al., 2019). This process converts judgments that are more subjective in

nature to objective and quantifiable measures. Yang et al. (2019) state that it is one of the most preferred MCDM methods, as the results obtained are found to be more reliable than other methods. The AHP has been used as a single analytical method (Cheng & Li, 2001) or as a hybrid method (Ortiz-Barrios et al., 2020) used in combination with other MCDM techniques. Although researchers have widely preferred this MCDM method due to its simple and reliable approach, it has several disadvantages. While the AHP method is helpful for ranking alternatives and establishing criterion weights, it operates under the assumption of criteria independence. Hence, it neglects the potential of interactions and dependencies among the criteria (Si et al., 2018). Also, the increase in the number of criteria and alternatives makes the process of pairwise comparison complex, lengthy, and more susceptible to inconsistencies (Asadabadi et al., 2019)

3.1.1 Eigenvector method

The Eigenvector method (EV) under the AHP is a popular approach for decision ranking. It operates under the assumption that minor adjustments to the elements represented by a_{ij} will result in corresponding minor changes to the eigenvalues associated with the comparison matrix A. These changes will cluster around the eigenvalues of the consistent matrix denoted as A_c. Thomas L. Saaty established that the primary eigenvector of matrix A can be employed as the preferred priority vector (Pradhan et al., 2021). In this method, analysis of pairwise comparison matrices is done with the help of eigenvalues and eigenvectors. The consistency of the judgment is determined by the consistency ratio (CR), defined by comparing the principal eigenvalue with the random consistency index value, wherein a lower CR denotes that decisions have low logical contradictions (Saaty, 2013). Once the pairwise comparison matrices are consistent, eigenvectors corresponding to the principal eigenvalues are used to calculate the weights of criteria and alternatives. These weights represent the relative importance of each element in the decision hierarchy.

As detailed by Pradhan et al. (2021), the EV method is based on solving the Equation (1):

$$A\omega = \lambda_{max}\omega,\ e^{T}\omega = 1 \tag{1}$$

Herein, the principal eigenvector λ_{max} of A is determined by solving the characteristic Equation (2),

$$|A - \lambda_{max}I| = 0 \tag{2}$$

The value of λ_{max} helps in determining the eigenvector $\omega = (\omega_1, \omega_2, \omega_3 \ldots. \omega_n)$ from:
$(A - \lambda_{max}I)\omega = 0$.

Bana E Costa and Vansnick (2008) argue that the eigenvalue method can violate the condition of order preservation, which is fundamental to decision-making and weakens the application of the AHP as a tool for decision-making. Also, the accuracy of the result depends on the pairwise comparison matrices based on the ranking of relative elements. However, Saaty (2013) contended that these limitations can be addressed using sensitivity analysis and consistency ratio and argued that it is a robust technique for dealing quantitatively with a complex network.

The consistency ratio (CR) is calculated, assessing the validity of these comparisons. Before computing the CR, a consistency index (CI) is determined from an $n \times n$ matrix using the formula $CI = (\lambda max - n)/(n - 1)$, where λmax is the matrix's maximum eigenvalue and n is the matrix dimension. The CR is then calculated as $CR = CI/RI$, with RI representing the random consistency index. The evaluation is acceptable if the CR is within the specified threshold; otherwise, decision-makers must revisit and refine the pairwise comparisons to enhance the process. Pairwise comparisons yield ranked matrices for each hierarchy level. The number of matrices aligns with the elements in each level. After creating all matrices, relative weights and maximum eigenvalues (λmax) are computed. Once pairwise comparisons are consistent across all levels, judgments are synthesized to establish the priority rankings of criteria and sub-criteria, ultimately culminating in calculating global weights. The AHP provides a systematic approach to multicriteria decision-making, ensuring a structured and rational process.

Figure 1 shows the hierarchy tree of the identified factors used in the study.

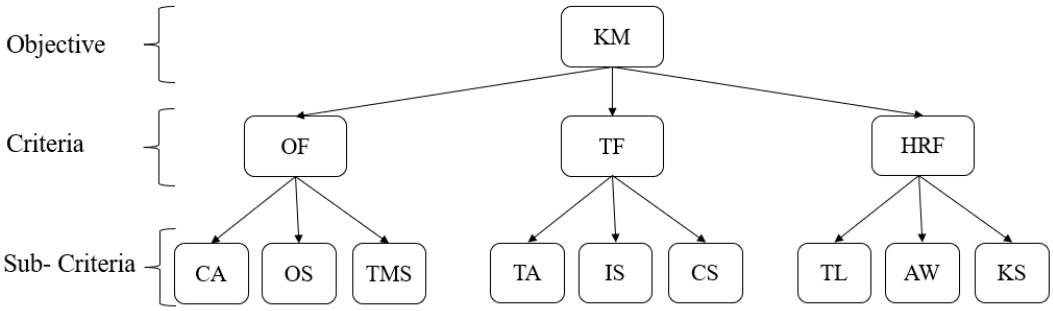

Figure 1 Hierarchy tree for the analysis

3.2 DEMATEL method

The DEMATEL technique analyzes the interconnections between elements (Gabus & Fontela, 1972). It categorizes them into cause-and-effect groups based on the nature and direction of their relationship (Huang et al., 2007). Si et al. (2018) show that apart from the classical DEMATEL approach, fuzzy and grey DEMATEL is also being applied in situations wherein experts' judgments about the given preferences are not clear and the availability of data is limited. The methodology has been widely used in the computer science and engineering domains. In the last decade, its application in the business and management domain has significantly increased due to increasing complexities in the decision-making processes in these domains. Although other MCDM methods, like Interpretive Structural Modeling, also provide the causal relationship between the factors, the DEMATEL method evaluates the strength of the relationships (Khan et al., 2024). However, being prone to expert subjectivity and judgment error, the classical DEMATEL version has been subject to criticism (Si et al., 2018).

The DEMATEL method is divided into four basic steps: generating the direct relation matrix based on expert suggestions, normalizing the values of the direct relation matrix, creating a total relation matrix, and creating a causal diagraph.

Step 1: Compute the average of the direct-influence matrix (mean scores depicting the relationship between factors) derived from experts. The experts' assessments of the relationship between factors, denoted as a_{ij}, are conveyed through a scoring system ranging from 0 to 4 (Gabus & Fontela, 1972). In this scale, 0 signifies no influence, 1 signifies minimal influence, 2 signifies moderate influence, 3 signifies high influence, and 4 signifies very high influence. Respondents were instructed to indicate the degree of influence of factor i on factor j. Equation (3) illustrates that the relationship score between a factor and itself is zero.

$$a_{ij} = \begin{bmatrix} 0 & a_{12} & a_{1n} \\ a_{21} & 0 \ldots & a_{2n} \\ a_{n1} & a_{n2} \ldots & 0 \end{bmatrix} \tag{3}$$

where: a_{21}, a_{1n}, ... are mean scores of experts on the influence of i on j.

Step 2: Normalize the direct-influence matrix a. The normalized matrix (B) is derived by using Equations 4-5:

$$B = a_{ij/k} \tag{4}$$

$$k = max(max_i \sum_{j=1}^{n} a_{ij}, max_j \sum_{i=1}^{n} a_{ij}), ij \in \{1,2,\ldots,n\} \tag{5}$$

where,

$max_i \sum_{j=1}^{n}$ = the maximum value of the sum of mean scores in each row,

$max_j \sum_{i=1}^{n}$ = maximum value of the sum of mean scores in each column

Step 3: Calculate the Total Influence Matrix with the help of Equation (6)

$$T = B + B^2 + \ldots + B^k = B(I-B)^{-1} \tag{6}$$

Where,

I is the identity matrix of B

$B = [A_{ij}]$, $\lim_{k\to\infty}\left(B + B^2 + \cdots + B^k\right)$ represents Indirect Influence Matrix

Step 4: Identify causal relationships by computing overall prominence ($R_i + C_j$) and net effect (R_i-C_j), wherein values of R_i and C_j are derived by Equations (7) and (8).

$$Ri = \left[\sum_{j=1}^{n} t_{ij}\right]_{nX1} \quad (7)$$

$$Cj = \left[\sum_{i=1}^{n} t_{ij}\right]_{1Xn} \quad (8)$$

4. Business scenario: Success factors of knowledge management practices in the financial sector

4.1 Data and variables

A mix of respondents with varying experience in the relevant field and diverse designations were selected for the study to get a wide perspective. A total of 15 participants from the banking and insurance sectors in India participated in the AHP analysis. All the participants had more than ten years of experience in the financial industry. Out of 15 participants, two belonged to the top management/senior level, eight belonged to the middle level, and five belonged to the lower levels of management. The reason for inviting and selecting participants from all levels of management was to consider their diverse viewpoints in decision-making.

Further, the DEMATEL analysis was conducted by a panel of six experts (two academicians and four industry professionals). The interviews were conducted on a video call, wherein the participants discussed and assigned values together. The analysis was performed between September and November 2023.

4.2 Analysis, results, and implications

4.2.1 AHP analysis

The Analytical Hierarchy Process prioritizes the identified factors based on their relative importance. Based on discussions with industry experts, the main criteria and sub-criteria results are shown in Table 3.

Table 3
Pairwise Comparison Matrix

Main Factors					
	OF	TF	HRF	Criteria Weight	Rank
OF	1	0.23	4.56	0.229	2
TF	4.26	1	7.16	0.701	1
HRF	0.22	0.14	1	0.07	3
Organizational Factors					
	CA	OS	TMS	Criteria Weight	Rank
CA	1	0.24	0.17	0.08	3
OS	4.17	1	0.31	0.27	2
TMS	5.75	3.27	1	0.65	1
Technological Factors					
	TA	IS	CS	Criteria Weight	Rank
TA	1	0.3	0.18	0.1	3
IS	3.33	1	0.48	0.31	2
CS	5.65	2.07	1	0.59	1
Human Resources Factors					
	TL	AW	KS	Criteria Weight	Rank
TL	1.00	0.31	0.22	0.11	3
AW	3.27	1.00	0.29	0.25	2
KS	4.50	3.40	1.00	0.64	1

As denoted through criteria weights in Table 3, technological factors impact the knowledge management process the most, followed by organizational and human resources factors. Top management support is weighted as the most critical factor within the organizational factors, followed by organizational structure and cultural aspects. Collaborative systems are weighted as the most critical factor within the technological factors, followed by infrastructural support and technological adoption. Knowledge sharing is weighted as the most significant factor within human resources, followed by an agile workforce, training, and learning.

Table 4
Local and global weights

Criteria	Sub-Criteria	LW	GW	Rank
Organizational Factors (OF)	Cultural Aspects (CA)	0.0848	0.0194	7
	Organizational Structure (OS)	0.2650	0.0608	5
	Top Management Support (TMS)	0.6502	0.1491	3
Technological Factors (TF)	Technological Adoption (TA)	0.0986	0.0690	4
	Infrastructure Support (IS)	0.3069	0.2150	2
	Collaborative Systems (CS)	0.5945	0.4165	1
Human Resources Factors (HRF)	Training & Learning (TL)	0.1052	0.0074	9
	Agile workforce (AW)	0.2545	0.0178	8
	Knowledge Sharing (KS)	0.6403	0.0449	6

Table 4 summarizes the local and global weights of the success factors to understand their rank overall as well as within the criteria. The analysis of global weights shows that including all criteria, the presence and usage of collaborative systems are the most critical success factors for implementing and managing knowledge management in the financial sector. The prevalence of collaborative applications and systems facilitates real-time organizational communication and fosters cross-functional collaboration. It makes processes like document sharing and version control more transparent. This finding is significantly important as the usage of collaborative systems within organizations is a more recent phenomenon, and hence, its prominence has rarely been highlighted in any extant literature. Infrastructural support is also needed to perform the various activities efficiently. The infrastructure must be robust enough to rapidly incorporate changes and provide more comprehensive support when scaling up.

4.2.2 Sensitivity analysis

A sensitivity analysis was performed with the help of the online SuperDecisions software to gain insight into how the results change with changes in model coefficients. As Technological Factors (TF) are the most significant criteria (0.701), they have been used as the independent variable to obtain the sensitivity graph. In Figure 2, the criterion priority of TF is plotted on the x-axis, whereas the criterion priority of four companies has been plotted on the y-axis. Table 5 details the change in alternative priorities concerning the nine-point criterion priority shift. The graph shows that Company 1 remains the preferred alternative despite the change in criterion priority. The priority weights of the other companies have minor variations. Company 3 becomes the least preferred alternative after 0.5.

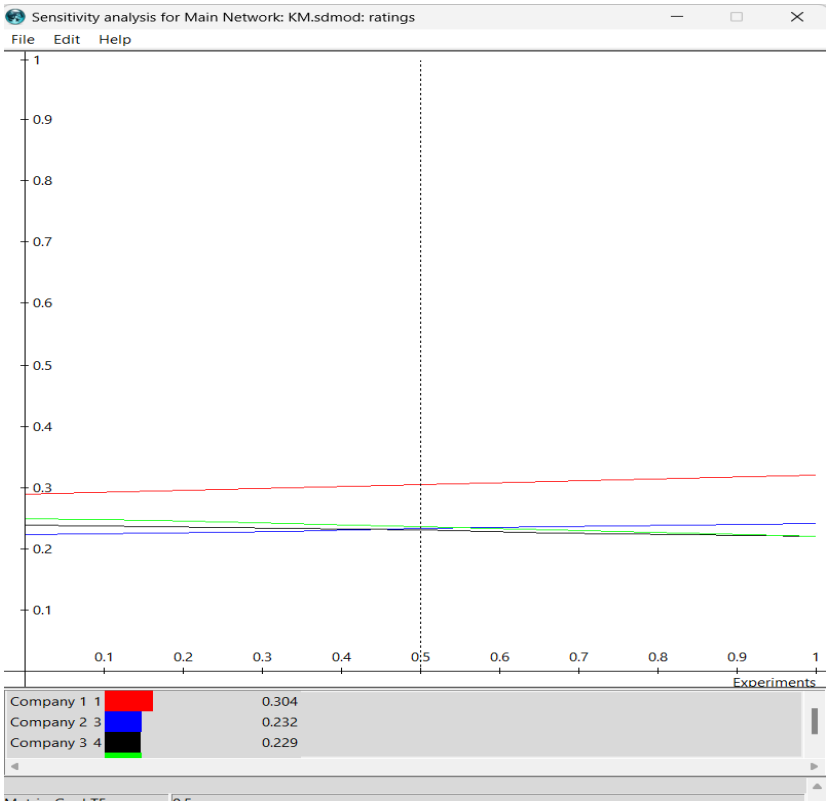

Figure 2 Sensitivity graph – with criteria TF for four alternatives

Table 5
Sensitivity analysis

	Matrix Selection: Technological Factors			
Frequency Parameter (rounded-off values	Company 1	Company 2	Company 3	Company 4
0.1	0.291	0.225	0.236	0.247
0.2	0.295	0.227	0.235	0.244
0.3	0.298	0.228	0.233	0.241
0.4	0.301	0.23	0.231	0.238
0.5	0.304	0.232	0.229	0.235
0.6	0.307	0.233	0.227	0.232
0.7	0.311	0.235	0.225	0.229
0.8	0.314	0.237	0.224	0.226
0.9	0.317	0.238	0.222	0.223

4.2.3 DEMATEL application

The responses collected from the respondents are summarized in Table 6. The scores show the impact of one barrier on another on a scale of 0 to 4, wherein 0 shows no influence and 4 shows very high influence.

Table 6
Direct relationship matrix by experts

	CA	OS	TMS	TA	IS	CS	TL	AW	KS
Cultural Aspects (CA)	0	1	3	2	2	1	2	2	3
Organizational Structure (OS)	3	0	0	0	3	0	3	1	3
Top Management Support (TMS)	2	1	0	2	3	2	2	2	3
Technological Adoption (TA)	1	0	1	0	0	2	1	1	2
Infrastructure Support (IS)	0	3	3	3	0	3	2	2	2
Collaborative Systems (CS)	0	0	0	3	1	0	3	3	1
Training & Learning (TL)	0	0	0	3	1	2	0	3	3
Agile workforce (AW)	0	2	0	3	3	3	0	0	1
Knowledge Sharing (KS)	0	1	1	3	2	3	3	0	0

Table 7 shows the normalized values in the relationship matrix, followed by the total relationship matrix in Table 8. The total relationship matrix highlights the significant relationships between the factors wherein the threshold value is the average of the scores. Tables 8 and 9 highlight the prominent relationships between the factors.

Table 7
Normalized direct relation matrix

	CA	OS	TMS	TA	IS	CS	TL	AW	KS
Cultural Aspects (CA)	0.0	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.2
Organizational Structure (OS)	0.2	0.0	0.0	0.0	0.2	0.0	0.2	0.1	0.2
Top Management Support (TMS)	0.1	0.1	0.0	0.1	0.2	0.1	0.1	0.1	0.2
Technological Adoption (TA)	0.1	0.0	0.1	0.0	0.0	0.1	0.1	0.1	0.1
Infrastructure Support (IS)	0.0	0.2	0.2	0.2	0.0	0.2	0.1	0.1	0.1
Collaborative Systems (CS)	0.0	0.0	0.0	0.2	0.1	0.0	0.2	0.2	0.1
Training & Learning (TL)	0.0	0.0	0.0	0.2	0.1	0.1	0.0	0.2	0.2
Agile Workforce (AW)	0.0	0.1	0.0	0.2	0.2	0.2	0.0	0.0	0.1
Knowledge Sharing (KS)	0.0	0.1	0.1	0.2	0.1	0.2	0.2	0.0	0.0

Table 8
Total relationship matrix

	CA	OS	TMS	TA	IS	CS	TL	AW	KS
Cultural Aspects (CA)	0.00	0.01	0.05	0.05	0.04	0.02	0.04	0.04	0.08
Organizational Structure (OS)	0.04	0.00	0.00	0.00	0.06	0.00	0.07	0.02	0.07
Top Management Support (TMS)	0.02	0.01	0.00	0.06	0.07	0.05	0.05	0.04	0.08
Technological Adoption (TA)	0.01	0.00	0.01	0.00	0.00	0.03	0.01	0.01	0.03
Infrastructure Support (IS)	0.00	0.05	0.05	0.09	0.00	0.08	0.05	0.04	0.05
Collaborative Systems (CS)	0.00	0.00	0.00	0.07	0.01	0.00	0.05	0.05	0.01
Training & Learning (TL)	0.00	0.00	0.00	0.07	0.01	0.04	0.00	0.05	0.06
Agile Workforce (AW)	0.00	0.02	0.00	0.07	0.05	0.06	0.00	0.00	0.02
Knowledge Sharing (KS)	0.00	0.01	0.01	0.07	0.03	0.07	0.06	0.00	0.00

Table 9
Effect of each factor (total and net)

	Ri	**Ci**	**Ri+Ci**	**Prominence Ranking**	**Ri-Ci**	**Causal Ranking**	**Relation**
Cultural Aspects (CA)	0.34	0.06	0.40	8	0.28	1	Cause
Organizational Structure (OS)	0.25	0.11	0.36	9	0.15	3	Cause
Top Management Support (TMS)	0.38	0.11	0.49	6	0.27	2	Cause
Technological Adoption (TA)	0.09	0.48	0.57	3	-0.39	9	Effect
Infrastructure Support (IS)	0.41	0.28	0.69	1	0.13	4	Cause
Collaborative Systems (CS)	0.19	0.35	0.55	5	-0.16	8	Effect
Training & Learning (TL)	0.23	0.33	0.56	4	-0.10	6	Effect
Agile Workforce (AW)	0.23	0.26	0.48	7	-0.03	5	Effect
Knowledge Sharing (KS)	0.25	0.39	0.64	2	-0.14	7	Effect

As presented in Table 9, Cultural Aspects (CA), Organizational Structure (OS), Top Management Support (TMS), and Infrastructure Support (IS) are the causal factors wherein Cultural Aspects (CA) and Top Management Support (TMS) are more prominent. Figure 3 shows the causal relationship diagram of these factors, complementing the direction of their relationships based on Table 8. Cultural Aspects have a large influence on other factors. Knowledge Sharing (KS), Technological Adoption (TA), Training and Learning (TL), Agile Workforce, and Collaborative Systems (CS) fall in the category of effect group, wherein Technological Adoption (TA) is the most influential factor. Based on the findings, it is suggested that organizations strengthen their leadership and cultural aspects to influence knowledge management better within the organization.

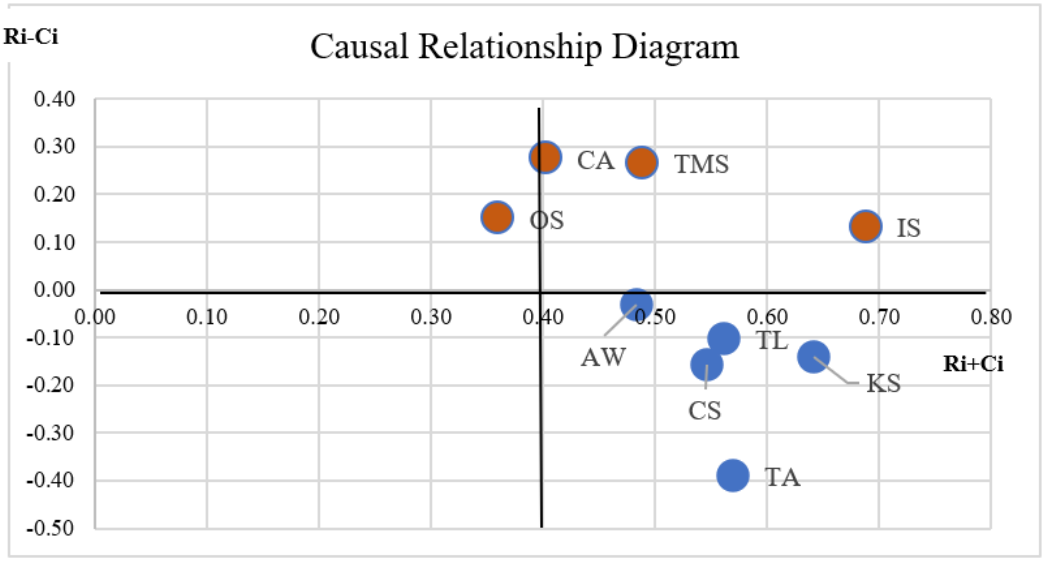

Figure 3 Causal relationship diagram

4.2.4 Discussion and implications of the study

While knowledge management is a widely researched topic, its contextual understanding in the financial sector is limited. In this context, the findings of this study have significant theoretical and managerial implications. This study adds to the extant literature on knowledge management in the context of financial services. The article adopts a hybrid approach of AHP-DEMATEL to understand the success factors of KM in the financial sector. Hybrid methods in MCDM are preferred due to their enhanced performance in handling uncertain data and intricate scenarios (Nain et al., 2023). These approaches yield superior outcomes by integrating multiple methods, thereby providing a triangulation mechanism that enhances the reliability and validity of the results (Singh et al., 2023).

Consequently, adopting hybrid methods emerges as a pragmatic and effective strategy in MCDM application, offering a nuanced and reliable approach to better decision-making. In the context of this study, using the hybrid approach of AHP-DEMATEL can help identify and understand the importance of various factors in KM in a financial institution. The AHP has been widely used in criteria prioritization while selecting alternatives in decision-making (Pradhan et al., 2019). However, it does not explore the scope of interrelation or causality among the criteria (Singh et al., 2023). The DEMATEL method complements the findings of the AHP by dividing the criteria into cause-and-effect groups, thus enhancing their understanding (Chen et al., 2022; Hossain & Thakur, 2020; Kumar et al., 2018). The efficacy of DEMATEL vis-à-vis the AHP is contingent upon contextual factors intrinsic to the specific decision-making scenario under consideration. Thus, adopting a measured stance that recognizes each method's distinctive strengths and limitations is imperative. We want to highlight that the hybrid approach undertaken in this study is incorporated to better understand the success factors by building on the strength of both techniques.

The AHP analysis establishes that technological factors are the most important factor (70% weightage) in contributing to the success of KM in the financial sector. These results differ from the findings of Castrogiovanni et al. (2016), who established the impact of human factors as most prominent in the context of KM. While some of the identified factors have been highlighted in previous research (Table 1), this study incorporated novel factors like collaborative systems and agile workforce based on expert advice. The analysis of the global weights of the sub-factors shows that Collaborative Systems (CS) is the most weighted criterion (42%). This outcome aligns with previous research in KM, underscoring the significance of collaborative networks and systems in safeguarding knowledge assets and optimizing their strategic value (Choudhary et al., 2013). Infrastructure support is the second most critical success factor, with 22% weightage. It conforms to extant literature highlighting the relevance of infrastructure facilities in KM excellence (Pandey & Dutta, 2013).

Further, the application of the DEMATEL analysis not only elucidates the interrelationship among factors but also facilitates the formulation of a strategic initiative by identifying and addressing factors that require primary attention. In order to build strong collaborative systems within organizations, companies should focus on the causal elements identified - changing organizational culture, aligning the interests of top management with the initiatives, and simplifying the hierarchical structure. The findings align with prior research, highlighting that culture is at the core of creating successful KM practices within an organization (Mårtensson, 2000).

In today's age of the knowledge economy, financial organizations have recognized the importance of effectively using the knowledge within organizations and integrating it for the benefit of their services and operations (Akkas & Asutay, 2023). An efficient KM within the financial sector helps in quality management (Aboyassin et al., 2011), technological advancements (Mehrabani & Sharjari, 2013), and building customer centricity (Shibab & Lestari, 2014). Thus, an investigation into the success factors of KM within the financial sector helps companies foster innovation and gain a competitive edge.

Though prior studies have investigated the factors impacting KM practices in the context of the financial sector (Castrogiovanni et al., 2016; Huang et al., 2011), the present study adds to the existing literature through its distinct methodological approach. This research identifies, prioritizes, and investigates the interrelationships of the success factors, thus providing a more complete understanding of them. The findings will be helpful in informed decision-making regarding implementing and optimizing KM initiatives. They will also help in resource optimization, as organizations can effectively allocate resources by focusing on factors that significantly contribute to KM.

5. Conclusion and future research directions

This article highlights the pivotal role of effective knowledge management (KM) within the financial sector. The success factors were identified with a review of extant literature and expert suggestions and were further evaluated using an integrated AHP-DEMATEL approach. The findings underscored the significance of technological factors as the most critical success factor for KM and emphasized that companies need to focus on building

collaborative systems within the organization to ensure proper communication within departments. Also, robust infrastructural support needs to be built to support the processes and activities.

A significant contribution of this article lies in its cognizance and mitigation of the limitations associated with the AHP in terms of identifying the interrelationships between the factors. With the use of the DEMATEL approach, the identified factors are differentiated from the cause-effect factors. This enables organizations to ascertain their priorities while making KM strategies. An efficient management of knowledge and its importance in fostering the growth of an organization is indisputable. In the financial sector, there is an amplified need to ensure the security of data and transparency in processes while balancing it with its proper usage to build agile processes. Herein, creating a robust knowledge management system within an organization can enable organizations to use the available information in a better and more timely manner. However, the study has certain limitations. The study had a small sample size and thus may suffer from subjective and selection bias. In future scope of research, the findings of this article need to be implemented, and cases need to be examined in detail to identify any contextual differences.

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