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Challenges and solutions for implementing knowledge management in knowledge-based companies supply chains

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Abstract

Purpose: This study investigates challenges in implementing knowledge management systems within supply chains of knowledge-based companies in Iran and proposes actionable solutions for effective application.

Methodology/Approach: A qualitative approach was employed, combining library studies, structured interviews with company founders, managers, and experts, and focus group discussions. A total of 182 propositions were categorized into six key themes—Financial Factors, Environmental Factors, Organizational Factors, Technology Factors, Personal Factors, and Strategic Action—and 31 subcategories.

Results/Findings: The research identified significant obstacles, including inadequate planning, insufficient training, unclear organizational roles, regional influences, political challenges, lack of awareness regarding benefits, and poor financial management. Recommended solutions include creating detailed plans, appointing dedicated roles for knowledge management, improving training, fostering adaptability, and optimizing financial management practices.

Conclusions: A systematic, proactive approach integrating strategic planning, cultural considerations, and flexible frameworks is essential for overcoming barriers. These measures enhance supply chain management and bolster competitiveness in a knowledge-driven economy.

Limitations: This study is specific to knowledge-based companies in Iran and may not reflect industries or regions with differing contexts.

Contribution: The findings provide valuable insights for policymakers, academics, and practitioners aiming to optimize knowledge management implementation, supporting innovation and efficiency in supply chains.

Keywords: *Content Analysis, Focus Groups, Implementation Challenges, Knowledge-based Companies, Knowledge Management, Supply Chain*

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1. Introduction

In the contemporary landscape of global business and innovation, knowledge has surpassed traditional assets, such as labor and capital, to become the primary driver of growth, efficiency, and competitive advantage. As organizations increasingly operate in complex, dynamic, and knowledge-intensive environments, the role of Knowledge Management (KM) has become central to their strategic and operational success. Knowledge Management (KM) extends beyond a mere tool or system; it represents

a comprehensive and integrated strategy for the creation, storage, dissemination, and application of knowledge aimed at improving decision-making, fostering innovation, and ensuring sustainable value creation over time (Philsoophian, Akhavan, & Namvar, 2022). The past two decades have seen a surge in the adoption of KM initiatives across diverse sectors, including academia, manufacturing, healthcare, and technology, in response to rapid globalization, digital transformation, and evolving customer expectations (Kassaneh, Bolisani, & Cegarra-Navarro, 2021).

From an academic and managerial perspective, KM is a key capability that enables organizations to remain agile and resilient in volatile marketplaces. As Intezari, Taskin, and Pauleen (2017) argue, organizations that can successfully manage and mobilize their intellectual assets will outperform their competitors and navigate uncertainty with greater confidence. Today, KM is viewed not only as a mechanism for knowledge retention and operational efficiency but also as a foundation for innovation, collaboration, and strategic renewal. However, these benefits depend on the extent to which knowledge is effectively captured, transferred, and institutionalized within and across organizational units.

In particular, the integration of KM into Supply Chain Management (SCM) has become a crucial area of focus in both academic literature and industry practice. As supply chains transition from linear production models to dynamic, interconnected networks, the efficient flow of knowledge among suppliers, manufacturers, distributors, and customers becomes increasingly essential (M. R. Zahedi & Khanachah, 2020). Knowledge embedded in supply chain processes, including procurement, logistics, demand forecasting, and relationship management, can significantly influence operational performance, cost reduction, and service quality. Effective KM practices can improve supply chain visibility, enable real-time decision-making, foster trust and transparency among partners, and facilitate joint problem solving.

Despite its clear advantages, the implementation of Knowledge Management (KM) in supply chains faces significant challenges. The tacit nature of knowledge—particularly experiential and context-specific insights—renders it difficult to codify, share, and reuse effectively (Bamel, Pereira, Bamel, & Cappiello, 2021). Organizational silos, hierarchical structures, technological limitations, and cultural resistance further exacerbate these challenges. Habib and Mehzabin (2024) highlight that individual reluctance to share knowledge—driven by fears of losing power, job security, or a lack of motivation—remains a prevalent barrier in knowledge-intensive environments. Nazam, Hashim, Baig, Abrar, and Shabbir (2020) emphasized that hierarchical organizational structures and weak cross-functional communication significantly hinder the diffusion of knowledge, thereby limiting the organization's capacity for learning and adaptation. These issues are particularly pronounced in knowledge-based companies, which are fundamentally built on intellectual capabilities, research expertise and innovation. In such companies, KM is not just a supporting function but also a core strategic activity. Knowledge-based firms rely heavily on their ability to create new knowledge, learn from their past experiences, and adapt to emerging trends and technologies. The absence of robust KM frameworks in these companies can result in missed opportunities, reduced productivity, duplication of efforts, and a decline in innovation potential of the company.

Moreover, knowledge-based companies often face additional pressures when operating in emerging economies or politically unstable regions. In contexts such as Iran, where knowledge-based industries are increasingly positioned as engines of national development, geopolitical challenges such as economic sanctions, regulatory fluctuations, and infrastructure limitations add complexity to KM implementation. Farahanifard and Adeli (2019) argue that transitioning to a knowledge-based economy requires not only investment in technology and education but also institutional support for KM systems and practices. The dynamics of the Iranian knowledge-based sector offer a compelling context for exploring the interplay between the KM and SCM. Many of these companies are in their early stages of development, with limited resources and evolving management structures. They must frequently overcome systemic issues, such as an unclear strategic vision, inadequate training programs, a lack of dedicated KM roles, and insufficient awareness of the benefits of KM. Cultural values, employee motivation, and regional disparities in education and infrastructure can create substantial implementation gaps.

This study seeks to identify and analyze the critical obstacles that impede the successful adoption of KM practices in the supply chains of knowledge-based firms. It also aims to propose actionable strategies and solutions to overcome these barriers and enhance the organizational readiness. By employing a qualitative research methodology, including document analysis, structured interviews with stakeholders, and thematic content analysis, this study provides a nuanced understanding of KM implementation in real-world settings. The resulting framework encompasses six major categories of challenges: financial, environmental, organizational, technological, personal, and strategic challenges. These categories were derived from 182 coded propositions extracted from expert interviews and validated through focus group discussions with senior managers and specialists.

By examining these themes in detail, this study contributes to the growing body of literature on knowledge-enabled supply chains and offers practical guidance for practitioners, especially in resource-constrained and transitional contexts. The findings underscore the importance of aligning KM strategies with organizational goals, developing tailored training programs, fostering a culture of collaboration and learning, and investing in the necessary technological infrastructure. Ultimately, this study aspires to bridge the gap between theory and practice by providing an evidence-based, context-sensitive roadmap for knowledge-based companies seeking to enhance their supply chain performance through effective knowledge management. Through a deeper understanding of the challenges and solutions, organizational leaders and policymakers can make informed decisions that support long-term competitiveness and innovation capacity in the knowledge-based economy.

2. Literature review

Knowledge Management (KM) has evolved into a crucial strategic capability for organizations navigating the complexities of the modern business landscape. At its core, KM is the process of systematically identifying, capturing, organizing, storing, sharing, and applying knowledge to enhance an organization's performance and innovation. As noted by Zighan, Dwaikat, Alkalha, and Abualqumboz (2024), KM plays a pivotal role in fostering competitive advantage, particularly in environments characterized by rapid technological advancement and frequent market disruptions. The foundational assumption of KM is that organizations that effectively manage their intellectual capital are better positioned to make informed decisions, adapt to changes, and achieve long-term sustainability.

KM is inherently interdisciplinary, integrating concepts and methodologies from diverse fields, including artificial intelligence, information systems, organizational behavior, human resource development, and strategic management. As M. R. Zahedi and Piri (2023) emphasize, KM initiatives often depend on enabling technologies and organizational cultures that foster learning, collaboration, and trust. Crucially, Knowledge Management extends beyond the implementation of IT systems; it involves a broader cultural and strategic transformation that integrates people, processes, and technologies to maximize the value of knowledge.

There is no universally accepted definition of the KM. Scholars have proposed over 70 definitions, each highlighting different dimensions of the knowledge process. However, a common thread across these definitions is the emphasis on knowledge as a dynamic, fluid, and context-dependent resource. Cajková, Jankelová, and Masár (2023) describe KM as the systematic production, organization, exchange, and integration of knowledge and experience among individuals and organizational units with common goals. In practical terms, this includes both explicit knowledge—documented and structured—and tacit knowledge, which resides in individuals' experiences, insights, and skills.

From a strategic perspective, effective KM requires a systems-thinking approach that aligns knowledge flow with the organization's core objectives. Shehzad, Zhang, Dost, Ahmad, and Alam (2024) emphasize that knowledge must be integrated into critical business processes such as decision-making, innovation, customer service, and supply chain operations. Moreover, KM initiatives should be supported by leadership commitment, continuous training, appropriate incentives, and an organizational

culture that values knowledge sharing. When executed well, KM contributes to internal efficiency and enhances responsiveness to external market changes.

Organizational learning is closely tied to KM. As Loon (2019) explains, a culture that encourages the generation, retention, and application of knowledge leads to improved strategic alignment, faster innovation cycles, and greater engagement. Therefore, KM is the foundation for agility and adaptability—two essential qualities in today's unpredictable business environment.

Supply Chain Management (SCM) has undergone significant transformation over the past two decades, driven by globalization, technological innovation, and rising customer expectations. SCM encompasses the planning, coordination, and control of all activities involved in the sourcing, procurement, production, distribution, and delivery of goods and services. It represents a critical function for enhancing organizational efficiency, responsiveness, and customer satisfaction (Pérez-Salazar, Lasserre, Cedillo-Campos, & González, 2017).

As global markets become more interconnected, supply chains have shifted from linear and transactional to complex, collaborative networks involving multiple stakeholders. Zhao, de Pablos, and Qi (2012) highlight the growing importance of supply chain integration, where seamless coordination among suppliers, manufacturers, logistics providers, and customers is essential for achieving competitive advantage. Today's supply chains must be agile, flexible, and resilient—qualities that depend significantly on the effective flow of knowledge and information across networks.

The role of knowledge in SCM has received increasing attention in recent years. Knowledge embedded in supply chain operations includes insights related to demand forecasting, procurement strategies, risk assessment, inventory management and customer preferences. As M. Zahedi, Abbasi, and Khanachah (2020) argue, the ability to leverage such knowledge can dramatically improve decision-making and enhance overall supply chain performance.

MacCarthy, Ahmed, and Demirel (2022) argue that mapping and managing knowledge flows are as critical as managing material and financial flows in modern supply chains. SCM is no longer solely about physical logistics; it is also about knowledge logistics, ensuring that the right information reaches the right decision-makers at the right time. Organizations that neglect the knowledge dimension of supply chains risk inefficiencies, communication breakdowns, and strategic misalignments.

Furthermore, the integration of KM and SCM is essential for improving cross-functional collaboration, promoting innovation and accelerating problem-solving. In particular, KM enables better coordination between internal departments and external partners, thereby fostering a more responsive and proactive supply chain management. As Rojas, Mula, and Sanchis (2024) suggest, leveraging KM in supply chain design and execution allows greater adaptability in volatile markets, enabling firms to respond to disruptions more effectively. The growing adoption of digital technologies, such as cloud computing, big data analytics, blockchain, and the Internet of Things (IoT), has further enhanced the potential for knowledge-enabled supply chains. These technologies facilitate real-time data sharing, predictive analytics, and automated decision-making, all of which are underpinned by robust KM frameworks. However, the successful adoption of these technologies also depends on organizational readiness, employee competence, and strategic alignment, all of which are rooted in effective KM practices.

Knowledge-based companies are organizations whose primary assets are intangible and intellectual. These firms rely on specialized knowledge, skills, and innovation to create value, develop products, and provide services. The emergence of a knowledge-based economy has led to a fundamental shift in how organizations are structured, managed, and evaluated. Ghorbani and Khanachah (2020) characterize knowledge-based companies as entities that achieve competitive superiority through their proficiency in creating, utilizing, and monetizing knowledge.

Unlike traditional manufacturing or service companies, knowledge-based firms operate in environments that are characterized by rapid change, high uncertainty, and intense competition. These organizations

must constantly update their knowledge bases, invest in employee development, and adopt flexible structures to remain viable. As Gökçe and Pelit (2023) observed, the organizational DNA of knowledge-based firms must be designed for agility, continuous learning, and innovation. In such companies, KM is not an optional add-on but rather a strategic necessity. The ability to manage knowledge effectively determines whether firms can identify emerging opportunities, mitigate risks, and scale innovations. According to Ghorbani and Khanachah (2020), knowledge-based firms must identify knowledge gaps, develop robust KM systems, and establish internal knowledge networks to promote collaboration and learning in the organization. The absence of KM infrastructure in knowledge-based firms often results in fragmented knowledge flows, redundant efforts and delayed project execution. For instance, when there is no formal mechanism for capturing lessons learned or best practices, valuable insights may be lost as employees leave or move to other departments. This not only reduces efficiency but also hampers innovation and the long-term growth.

Establishing a culture of knowledge sharing and continuous learning is essential for sustaining knowledge-based companies. This involves more than just installing IT systems; it requires building trust, offering incentives, and aligning individual and organizational goals. Farahanifard and Adeli (2019) emphasized that transitioning to a knowledge-based economy—especially in emerging markets–demands not only investment in infrastructure and education but also a fundamental shift in mindset and organizational culture. Moreover, knowledge-based firms must proactively engage with external knowledge sources, such as research institutions, universities, industry associations, and government agencies. Through strategic partnerships, these companies can access new ideas, tap into specialized expertise, and participate in collaborative innovation ecosystems. This external orientation complements internal KM efforts and enhances organizational learning. Finally, in regions such as Iran, where knowledge-based firms face additional constraints such as political instability, economic sanctions, and infrastructural limitations, the role of KM becomes even more critical. These companies must build resilience through the use of strategic knowledge, flexible processes, and adaptive leadership. By embedding KM into their core operations and aligning it with supply chain strategies, knowledge-based firms can not only survive but also thrive in complex and uncertain environments.

In recent years, companies have seriously applied supply chain management strategies to their organizations. Knowledge management is one of the factors in empowering the supply chain and a vital feature of the organization (Simchi-Levi, Kaminsky, & Simchi-Levi, 2004). According to the background of the knowledge chain, the development of knowledge throughout the supply chain benefits all members. By combining the literature on supply chain management and knowledge management, as well as the organizational transformation related to the knowledge frontier, it can be concluded that the unit of experience and analysis should develop from the level of organizational knowledge management to supply chain management (Gardeazabal et al., 2023).

In this regard, a study (Kakwan & Modiri, 2018) divided the factors of non-acceptance and implementation of knowledge management in the supply chain into five groups: 1- Strategic Factors, 2- Organizational Factors, 3- Technological Factors, 4- Cultural Factors, and 5- Individual Factors (See Table. 1).

Table. 1. The theoretical framework of the research

Raw	Main factors	Obstacles of implementation	Recourses
1	Strategic Factors	Lack of sufficient budget allocation	Zhao et al. (2012)
		Lack of clear understanding of knowledge management acceptance	
		Lack of integration of knowledge management with business process supply chain	
		Lack of proper methodology in acceptance of knowledge management	

2	Organizational Factors	Lack of appropriate organizational structure and limitation of communication and knowledge flows	Philsoophian et al. (2022)
		Lack of high priority of maintaining the knowledge of experienced and skilled employees	
		Lack of organizational resources to provide suitable opportunities	Sartori, Frederico, & Silva, H. (2022)
		Formal and informal environments	Wen, & Wang, (2022)
3	Technological Factors	Lack of appropriate technological infrastructure	Irfan, Sumbal, Khurshid, F., & Chan, (2022)
		Defects in technological infrastructure for acceptance of knowledge management	
		Low data security	Wong et al. (2022)
		No exchange of services	Baah et al. (2022).
		No technical cooperation for suppliers	Wen, & Wang, (2022)
4	Cultural Factors	Lack of knowledge sharing	Habib and Mehzabin (2024),
		Lack of commitment and trust among the members of supply chain	
		No empowerment among the members of supply chain	Wong et al. (2022)
		Lack of motivation and reward	Wen, & Wang, (2022)
5	Individual Factors	Different cultures, values and linguistic environments among members	Golgeci, Makhmadshoev, & Demirbag, (2021)
		Lack of enough time to share knowledge	
		Fear of losing intellectual property	Daghfous, Qazi, & Khan, (2021)
		Employee Weakness and Poor Communication and Information	

Source: Authors

3. Research methodology

This research is a development-focused study that aims to delve into the complexities of knowledge management within supply chains. The data collection process incorporated a mix of library studies, document analysis, and articles on the challenges and barriers faced in the realm of knowledge management. Additionally, this research benefits from interviews with key stakeholders and the use of qualitative data analysis techniques. The integration of these approaches ensured a comprehensive examination of the topic and effectively addressed various dimensions of the subject matter.

A significant feature of this research is the employment of the focus group method, which facilitates in-depth group discussions aimed at exploring specific currents and themes in the literature. By bringing together participants with diverse perspectives, focus groups help uncover deeper insights and shared viewpoints, thereby enhancing the richness of qualitative data. This approach is highly effective for understanding complex social phenomena and collaborative problem-solving. The discussions not only generate valuable data but also foster a collective analysis of the challenges and barriers to the application of knowledge management principles. Qualitative content analysis was the cornerstone of data interpretation in this study. This analytical method is carefully structured and comprises four stages. The first stage, open encoding, involves dissecting units of analysis into their smallest conceptual elements, allowing researchers to extract meaningful concepts from objective data. This process is iterative and ensures a thorough examination of all aspects related to the subject under investigation. Following this, the grouping phase begins, wherein similar concepts are categorized into larger subcategories. This phase is crucial for identifying patterns and connections between various ideas, leading to the formation of comprehensive subcategories.

In the categorization stage, these subcategories are further grouped into larger entities known as main categories. Torabi and Tahouri (2024) highlight the significance of this stage, as it provides a framework for comprehensively describing phenomena, increasing researchers' understanding of the subject matter, and contributing to the production of new knowledge. The creation of main categories serves as a pivotal step in qualitative analysis, enabling researchers to develop a structured and organized understanding of the phenomena under study. The final step in qualitative content analysis is abstract interpretation, which involves synthesizing categorized data to achieve a broader understanding of the phenomenon under investigation. This step is characterized by a transition from objectivity to subjectivity, allowing researchers to interpret the data meaningfully and uncover new insights into the subject. As noted by Neuman (2000), abstract interpretation is the gateway to discovering overarching themes and generating general knowledge of the topic at hand.

To ensure the validity and reliability of the findings, the fundamental categories and information derived from this research were rigorously reviewed by university and industry experts. Their critical evaluation not only validated the accuracy of the results but also enriched the research by incorporating their professional insights. Furthermore, the research methodology prioritizes diversity within the focus groups, capturing a wide spectrum of ideas and viewpoints. This inclusive approach safeguards the comprehensiveness of the vision presented and ensures that the research outcomes reflect a holistic understanding of the challenges of knowledge management in supply chains. The study is illustrated in Figure 1.

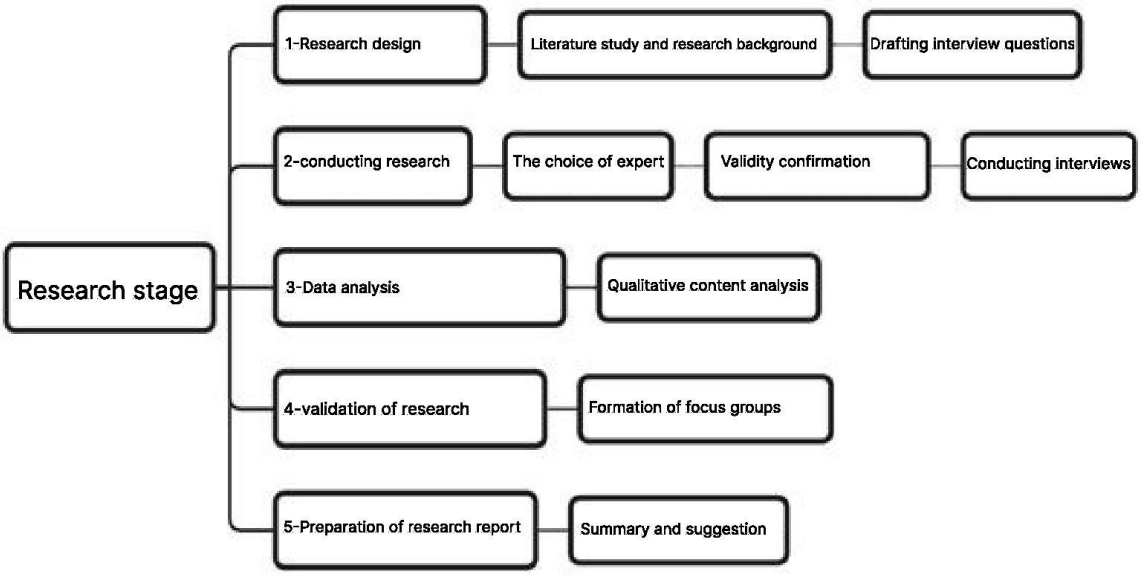

Figure 1. Research steps
Source: Authors

4. Results and discussion

Following the interviews and subsequent analysis, the output consisted of a series of propositions that were categorized into subcategories and then into broader, main categories. Based on the extracted propositions, 30 subcategories and six main categories emerged. Through an extensive review of the interviews and comparison with related studies, the researchers concluded that the extracted propositions were comprehensive, and any newly identified propositions tended to be repetitive or closely aligned with the existing ones. Table 2 presents the finalized propositions along with their corresponding subcategories and main categories of the study.

Table 2. Main and sub-categories resulting from propositions

Raw	Main Category	Sub-categories	Examples of statements related to main & subcategories	Number of propositions
1	Financial Factors	Failure to Allocate Financial Resources	Companies intentionally or unintentionally do not budget for knowledge management	6
2		Lack of Financial Resources	In some companies, there is no source for this due to financial problems	3
3		Financial Needs	Many financial problems make it out of financial priority	7
4		Lack of Investment Perspective on Knowledge Management	Costs related to knowledge management are considered non-returnable costs	2
5		Lack of Knowledge of Financial Management	There is no specific financial planning in some companies	3
6	Environmental Factors	Country, Political Conditions	Political changes cause changes in decisions	10
7		Boycott	Sanctions in many cases cause many deficiencies and deficiencies in companies, which all potentials are used to solve them.	15
8		Cultural factors of region	There is no desire for progress in culture of people of this region	10
9		Difference in Values in Region	For some areas, learning is not a value	6
10		Depression and Lack of Morale Among People of a Region	lack of spirit and energy reduces desire to learn	4
11		Learning Culture and Learnability	It is less in some educational areas	8
12	Organizational Factors	Employee Conflict	Behavioral and work conflicts often increase conflicts	6
13		Lack of Allocation of Organizational Resources Needed to Implement Knowledge Management	To implement this, resources of organization must be defined and identified so that they can be used better	4
14		Lack of Commitment to Work of Employees	In some cases, employees refuse to do this	5
15		Lack of Proper Organizational Structure	There is no suitable job position for this	8
16		Organization Size	Since our organizations are not big, this responsibility is responsibility of CEO, which is not done very often	10
17	Technological Factors	There was no Infrastructure	There is no suitable system for implementing knowledge management in the company	12
18		Preventing Employees from Using Technology	It is very difficult to use new technologies and technology in companies	4
19		Difficulty Setting up New System and Synchronizing with Old System	It is expensive and difficult to coordinate all systems or to replace them	3
20		Uncertainty about Security of Technological Systems	Information security in these new systems is very low	5
21		Uncertainty about Security of Technological Systems	There must be a comprehensive system to coordinate all parts of a supply chain, which does not exist or is not readily available	5
22	Personal	Unhealthy Employee Competition	Some employees confuse competition with hostility	7

23		Fear of Starting a New Job	Getting used to existing system makes it difficult to enter new system	3
24		Look at Futility of Work Before Starting	If it is done and results are not achieved, it is a very big reason for people not to do it	1
25		Lack of Desire to Progress	Whatever is there now is enough	3
26		Personal Values	I have a different view of business	6
27	Strategic Factors	Lack of Strategic Plan to Implement Knowledge Management	I have not planned or thought about this	8
28		Absence of Organizational Role and Task Description	We have no one to do this	8
29		Senior Managers are not Aware of Results of Implementing Knowledge Management	If it is done, what will be result that will lead us to this task	4
30		Lack of Priority in Implementing Knowledge Management	There are more important things to do	5
31		Absence of Formal Training Program for Employees	Training program does not exist for various reasons	3
Total	6	31		182

Source: Authors

The results of data coding, implementation of interviews, and formation of sub- and main categories indicate the extraction of six main categories: "Financial Factors," "Environmental Factors," "Organizational Factors," "Technology Factors," "Personal Factors, " and "Strategic Factors"(See Table.3).

Table 3. Propositions, main and subcategories

Raw	**Main Category**	**Sub-categories**	**Propositions**
1	Financial Factors	5	21
2	Environmental Factors	6	53
3	Organizational Factors	5	33
4	Technological Factors	5	27
5	Personal Factors	5	20
6	Strategic Factors	5	28
Total	6	31	182

Source: Authors

The results of the interviews were discussed in a focus group after implementation and analysis of the data.
The characteristics of the focus group are presented in Table (4).

Table 4. Profiles of focus group members

Raw	**Position**
1	Director of Kermanshah Science and Technology Park
2	Director of Health Science and Technology Park of Kermanshah province
3	Secretary of Knowledge-Based Companies Association of Kermanshah Province
4	Director of Academic Jihad of Kermanshah Province
5	Deputy of Research, Razi University of Kermanshah
6	Deputy of research, Kermanshah University of Medical Sciences
7	Specialist and Active Expert in the industry

8	Specialist and Active Expert in the industry
9	Specialist and Active Expert in industry

Source: Authors

5. Conclusion

5.1 Conclusion

This study comprehensively investigates the key obstacles hindering the implementation of knowledge management (KM) systems within the supply chains of knowledge-based companies. The findings, derived from 182 validated propositions and extensive expert reviews, revealed seven dominant and interrelated challenges. Each reflects a critical dimension of the organizational and environmental context that must be addressed for KM to be effectively operationalized.

1) Inadequate Planning and Managerial Commitment

One of the most prominent challenges is the lack of a cohesive and executable strategy for KM integration. While some firms had drafted plans, they often lacked clarity, scope, or managerial follow-through. Successful KM implementation requires top-down strategic commitment with clear objectives, timelines, and follow-up mechanisms. Upper management must not only initiate but also sustain engagement through motivational tools, performance tracking, and feedback systems. Embedding KM into an organization's DNA begins with strategic foresight and leadership accountability.

2) Insufficient and Irregular Training Programs

The study emphasizes that knowledge-based firms often overlook the necessity of consistent, advanced, and up-to-date training. Without structured and adaptive learning opportunities, employees remain underprepared to contribute meaningfully to KM initiatives. Establishing continuous learning pathwaysaligned with evolving industry needsensures that staff remain agile, skilled, and responsive. Integrating knowledge-sharing platforms, mentorship programs, and collaborative workshops can enrich the learning ecosystem and drive active participation in KM processes.

3) Ambiguity in Organizational Roles and Responsibilities

The lack of clearly assigned roles, especially in KM-related functions, creates operational confusion and accountability gaps. In many cases, responsibilities were informally assumed by senior leaders who were already managing multiple priorities. This research underscores the importance of appointing dedicated KM officers or cross-functional teams to oversee system design, training, implementation, and evaluation. Clearly defined roles foster coordination, ownership, and sustained progress toward KM goals.

4) Cultural and Regional Complexities

Cultural dimensions significantly influence the perception and acceptance of KM practices. In regions where hierarchical norms or collective decision-making prevail, knowledge sharing may be constrained by status dynamics and risk aversion. Similarly, employee fatigue, motivational deficits, and resistance to change are often rooted in deep-seated cultural attitudes. Effective KM requires contextual sensitivity, which involves adapting strategies to local customs, values, and communication styles. Leveraging anthropological insights and fostering inclusive dialogue can enhance cultural alignment and employee buy-in.

5) Political and Economic Uncertainty

Frequent shifts in the regulatory environment, inflation, sanctions, and political interventions disrupt long-term planning and execution. KM systemsrequire sustained investment and a stable policy environment. This study recommends that firms build resilience into their KM strategies by incorporating flexibility, scenario planning, and contingency frameworks. Developing adaptive structures enables organizations to pivot in response to external shocks while preserving their institutional knowledge and continuity.

5.2 Limitation

Despite its comprehensive qualitative approach, this study had several limitations. First, while the sample size was rich in expertise, it was limited to a specific group of knowledge-based companies, which may not reflect the full spectrum of organizational types. Second, the dynamic and evolving nature of KM practices means that the findings may shift over time or in different industries. Third, the study relied primarily on interview-based insights, which, although triangulated with expert validation, may contain subjective bias. These limitations highlight the need for broader, more diversified future studies to test the generalizability and scalability of these findings.

5.3 Suggestion

Future research should quantitatively validate the proposed framework using larger and more diverse organizational samples. Studies could investigate the relative weight and interaction of each challenge across industries or geographic regions. Moreover, longitudinal research could offer insights into the long-term impact of KM interventions, revealing which strategies are the most sustainable over time. The integration of emerging technologies, such as AI, machine learning, and blockchain, into KM systems warrants deeper exploration. Finally, policy-level studies should examine how governmental or institutional support mechanisms can incentivize KM adoption in knowledge-driven sectors.

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