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Presentation of a Conceptual Model of a Comprehensive Knowledge-Based Organization Pattern Using Grounded Theory

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ABSTRACT

In the era of the knowledge-based economy, the aviation industry is confronted with complex challenges that have intensified the necessity for transformation toward knowledge-based organizations. Iran Air, as the flag carrier of this industry, requires a comprehensive and practical model for knowledge-based transformation in order to survive and grow within today's highly competitive environment. This study is designed based on the pragmatism paradigm and adopts a qualitative approach. The primary objective is to develop a comprehensive model of a knowledge-based organization for Iran Air by identifying key factors and the complex relationships among its constituent components. The statistical population consisted of managers, experts, and specialists from Iran Air, as well as aviation industry professionals in Iran with a minimum of 10 years of work experience. The sample was selected using purposive and snowball sampling methods and included 15 key experts, determined based on the principle of theoretical saturation. In the qualitative phase, data were collected through in-depth semi-structured interviews, participant observation, and analysis of organizational documents. Data analysis was conducted using the grounded theory approach across three stages—open coding, axial coding, and selective coding—using MAXQDA software. The findings led to the identification of 20 main categories and 105 concepts within a paradigmatic model. The "integrated knowledge-orientation system," comprising 15 concepts, was identified as the core phenomenon. Additionally, causal conditions (16 concepts), contextual conditions (29 concepts), intervening conditions (16 concepts), strategies (18 concepts), and consequences (11 concepts) were identified. The designed model provides a comprehensive framework for transforming Iran Air into a knowledge-based organization, encompassing an internal dimension focused on the development of human, cultural, managerial, and technological capabilities, and an external dimension focused on alignment with economic conditions and integrated knowledge systems.

Keywords: Knowledge-based organization, aviation, airline company, grounded theory.

Introduction

In the contemporary era characterized by the transition toward a knowledge-based economy, organizations are increasingly required to reconfigure their structures, processes, and strategies to effectively leverage knowledge as a strategic resource. Knowledge is no longer viewed merely as an auxiliary asset but rather as a critical driver of sustainable competitive advantage, innovation, and long-term organizational performance. The emergence of knowledge-intensive industries, particularly in technologically complex sectors such as aviation, has amplified the importance of knowledge-based organizational models that can systematically integrate knowledge creation, sharing, and application into their core operations [1, 2]. In such contexts, organizations that fail to adapt to knowledge-centric paradigms risk obsolescence in highly dynamic and competitive environments.

The concept of the knowledge-based organization has evolved significantly over the past decades, encompassing multiple dimensions including organizational culture, leadership, human capital, technological infrastructure, and strategic alignment. Knowledge management (KM) has been identified as a foundational mechanism for enabling this transformation, as it facilitates the systematic acquisition, storage, dissemination, and utilization of knowledge across organizational boundaries [3, 4]. The integration of advanced technologies, particularly artificial intelligence and digital platforms, has further enhanced the capabilities of KM systems, enabling organizations to process large volumes of data, generate insights, and support decision-making processes in real time [5, 6]. Consequently, the transition toward knowledge-based organizations requires a holistic and integrated approach that aligns technological, human, and structural dimensions.

Organizational culture plays a pivotal role in shaping the effectiveness of knowledge management initiatives. A culture that promotes trust, collaboration, and openness significantly enhances knowledge sharing behaviors among employees, thereby facilitating innovation and organizational learning [7, 8]. Conversely, rigid hierarchical structures and lack of trust may hinder knowledge flows and limit the effectiveness of KM systems [9]. The Competitive Values Framework highlights the importance of aligning organizational culture with strategic objectives to foster adaptability and responsiveness in complex environments [10]. In knowledge-intensive industries, cultivating such a culture becomes even more critical due to the reliance on specialized expertise and tacit knowledge.

Human capital is another critical determinant of knowledge-based transformation. Skilled and knowledgeable employees serve as the primary carriers of organizational knowledge, and their ability to create, share, and apply knowledge directly influences organizational performance [11, 12]. The development of human resources through training, learning, and empowerment initiatives is therefore essential for enhancing knowledge capabilities. Furthermore, the transfer of tacit knowledge into explicit forms, as highlighted in prior studies, remains a significant challenge that requires structured processes and supportive organizational environments [13]. The effectiveness of training programs and knowledge transfer mechanisms also depends on the organization's ability to evaluate learning outcomes and ensure continuous improvement [14].

From a structural perspective, organizational design and strategic alignment are crucial for the successful implementation of knowledge-based systems. Flexible and adaptive structures facilitate communication and collaboration across different units, enabling the efficient flow of knowledge and information [15, 16]. Additionally, the alignment between organizational structure and KM strategies ensures that knowledge initiatives are effectively integrated into the organization's overall strategic framework [17, 18]. The role of leadership in this context is also significant, as leaders are responsible for fostering a knowledge-oriented vision, supporting KM initiatives, and encouraging knowledge-sharing behaviors among employees [19, 20].

Technological infrastructure constitutes another essential component of knowledge-based organizations. The adoption of advanced information and communication technologies (ICT), including knowledge repositories, data analytics tools, and artificial intelligence systems, enables organizations to manage knowledge more effectively and support decision-making processes [4, 21]. Technology also plays a critical role in facilitating knowledge sharing and collaboration, particularly in geographically dispersed organizations [6]. However, the successful implementation of technological solutions requires careful consideration of organizational readiness, user acceptance, and integration with existing systems.

Despite the recognized benefits of knowledge management, organizations often encounter significant challenges in implementing KM initiatives. Common barriers include resistance to change, lack of managerial support, inadequate technological infrastructure, and insufficient alignment between KM strategies and organizational goals [22, 23]. These challenges are particularly pronounced in traditional organizations with rigid structures and limited experience in knowledge-based practices. Addressing these barriers requires a comprehensive approach that considers both internal and external factors influencing KM implementation.

In the aviation industry, the importance of knowledge management is further amplified due to the sector's complexity, safety requirements, and reliance on specialized expertise. Airlines operate in highly regulated environments and must continuously adapt to technological advancements, market dynamics, and external pressures such as economic fluctuations and geopolitical factors [24]. Effective knowledge management can enhance operational efficiency, improve service quality, and support strategic decision-making in such environments. Moreover, the integration of customer knowledge and market intelligence into organizational processes can create additional value and strengthen competitive positioning [1, 25].

Recent studies have emphasized the role of knowledge synergy, organizational learning, and innovation in enhancing organizational performance. The interplay between knowledge management and strategic human resource management has been shown to significantly influence organizational outcomes, including productivity, adaptability, and sustainability [12, 26]. Additionally, the emergence of open innovation and collaborative networks has highlighted the importance of knowledge exchange beyond organizational boundaries [2]. These developments underscore the need for integrated models that can capture the complexity of knowledge-based transformation and provide actionable insights for practitioners.

The design and implementation of knowledge-based organizational models require a systematic and evidence-based approach. Grounded theory has been widely used as a methodological framework for developing such models, as it allows researchers to identify key concepts and relationships based on empirical data [27, 28]. This approach is particularly suitable for exploring complex phenomena such as knowledge management, where multiple factors interact in dynamic and context-specific ways. By adopting a grounded theory approach, researchers can develop comprehensive models that reflect the realities of organizational contexts and provide practical guidance for implementation.

Furthermore, the integration of governance, strategic planning, and knowledge management is essential for achieving organizational transformation. Knowledge-based governance models emphasize the alignment of policies, processes, and resources with knowledge-oriented objectives, thereby enhancing organizational effectiveness and accountability [29]. Strategic planning plays a crucial role in this process by defining clear goals, identifying key performance indicators, and ensuring the alignment of KM initiatives with organizational priorities [18]. The evaluation of KM performance using advanced analytical techniques also contributes to continuous improvement and informed decision-making [30].

In addition, the role of organizational learning and affective commitment has been highlighted as a critical factor in sustaining knowledge-based initiatives. Employees' commitment to organizational goals and their willingness to engage in learning activities significantly influence the success of KM programs [31]. The development of professional learning communities and the promotion of organizational voice further enhance knowledge sharing and innovation within organizations [20]. These factors collectively contribute to the creation of a knowledge-driven organizational environment that supports continuous improvement and adaptability.

Despite the growing body of literature on knowledge management and knowledge-based organizations, there remains a need for context-specific models that address the unique challenges and opportunities of different industries. In the case of the aviation sector, the development of a comprehensive knowledge-based organizational model is particularly important due to the industry's complexity and strategic significance. Existing models often lack the integration of multiple dimensions, including cultural, technological, and structural factors, which are essential for effective implementation [25, 32]. Therefore, there is a clear research gap in the development of holistic models that can guide organizations in their transition toward knowledge-based systems.

Moreover, the dynamic nature of the aviation industry requires organizations to continuously adapt and innovate in response to changing conditions. The integration of knowledge management with strategic initiatives such as digital transformation, customer experience enhancement, and operational efficiency is essential for maintaining competitiveness in this sector [33, 34]. By leveraging knowledge as a strategic resource, airlines can enhance their resilience, improve service quality, and achieve sustainable growth in a highly competitive environment.

In light of the above considerations, this study seeks to address the existing gaps in the literature by developing a comprehensive and integrated model of a knowledge-based organization tailored to the specific context of the aviation industry. The study adopts a grounded theory approach to identify key factors and relationships that influence the successful implementation of knowledge management systems and organizational transformation. By focusing on a real-world organizational context, the study aims to provide practical insights and recommendations for practitioners and policymakers.

Therefore, the aim of this study is to design a comprehensive model of a knowledge-based organization for Iran Air by identifying key factors and the complex relationships among its constituent components.

Methodology

This study is designed based on the pragmatism paradigm and adopts a qualitative approach. The primary objective is to develop a comprehensive model of a knowledge-based organization for Iran Air by identifying key factors and the complex relationships among the components constituting such an organization. This combined approach enables the discovery of emerging patterns and the validation of structural relationships among variables, while ensuring the provision of operational and practical solutions for organizational transformation. The statistical population consisted of managers, experts, and specialists at various organizational levels of Iran Air, as well as aviation industry professionals in Iran who possessed at least 10 years of work experience, held a bachelor's degree or higher in relevant fields, and occupied key organizational positions. The sample was selected using purposive and snowball sampling methods and included 15 key experts, with an age distribution ranging from 35 to over 60 years and work experience ranging from 5 to more than 20 years. Sample selection was conducted based on the principle of theoretical saturation in grounded theory and continued until no new concepts emerged.

In the qualitative phase, data were collected through in-depth semi-structured interviews, participant observation, and analysis of organizational documents. The data collection process continued until theoretical saturation was achieved, and the quality of the instruments was confirmed through content validity and reliability. Qualitative data analysis was conducted based on the grounded theory approach in three stages: open coding, axial coding, and selective coding. In open coding, transcribed interviews were examined line by line, and initial concepts were extracted. Axial coding involved identifying

relationships among categories, determining the core category, and developing subcategories based on the paradigmatic model. Selective coding was conducted to integrate and refine the emerging theory, and MAXQDA software was used to ensure the rigor and quality of the analysis.

Findings and Results

The findings of this study are presented in the qualitative section and sequentially address the research questions.

Table 1

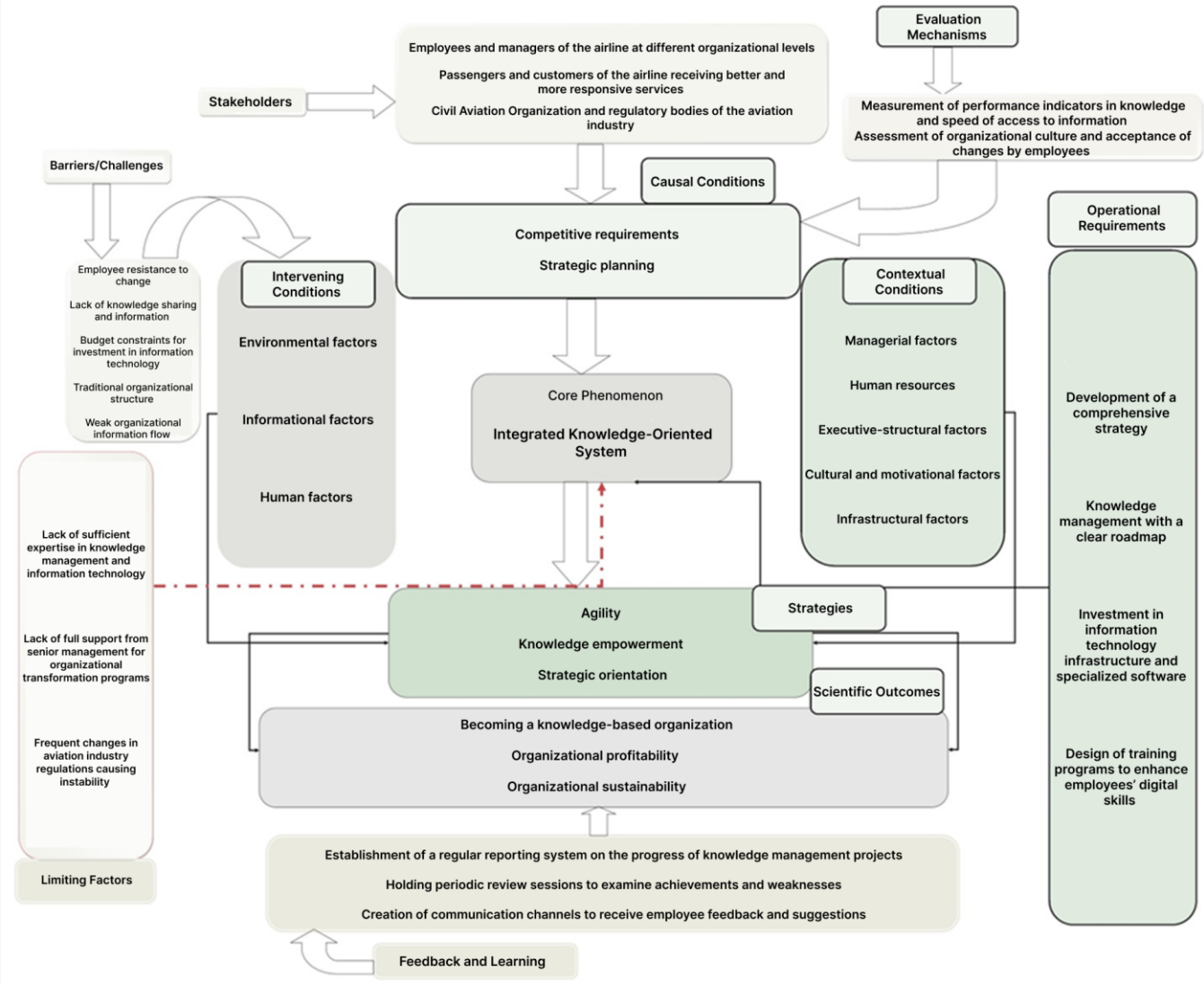
Conceptual Model of the Comprehensive Knowledge-Based Organization Pattern for Iran Air (Selective Coding)

Dimension/Indicator	Number of Concepts	Related Concepts	Description	Importance in Iran Air
Core Phenomenon: Integrated Knowledge-Oriented System	Main category (15 concepts)	—	—	—
Knowledge-Based Economy	3 concepts	Knowledge productivity, knowledge-based competitive advantage, production of goods and services based on knowledge	Creating economic value through optimal use of technical knowledge, operational experience, and passenger information	Very high – the aviation industry is highly dependent on technical knowledge, safety, and passenger experience
Knowledge-Based Organization	5 concepts	Knowledge management support, knowledge-oriented human resources, foresight, intelligent agents, flexible organization	Transformation of traditional organizational structure into one based on knowledge sharing, continuous learning, and flexibility	Very high – requires complex coordination among different sectors (piloting, engineering, passenger services)
Knowledge-Based Development	3 concepts	Intelligent knowledge orientation, positive approach to knowledge orientation, trust in knowledge orientation	Development of innovative and strategic approaches to leverage knowledge for continuous performance improvement	High – essential for competing with international airlines and improving market position
Knowledge-Based Strategy	4 concepts	Value of knowledge orientation, differentiation through knowledge, demand creation via knowledge, knowledge-based processes	Embedding knowledge orientation across all organizational processes	High – essential for up-to-date operations and competitive success domestically and internationally
Causal Conditions	16 concepts	—	—	—
Competitive Requirements	7 concepts	Resilience, organizational adaptability, up-to-dateness, focus on R&D, favorable work environment, customer service improvement, nationalism and global trade	Environmental and internal conditions compelling the organization to adopt change, innovation, and knowledge orientation	Very high – intense competition, sanctions, economic fluctuations, and high safety standards
Strategic Planning	9 concepts	Knowledge-based vision, long-term knowledge goals, competitive strategies, digital transformation planning, knowledge-based risk management, strategic performance evaluation, integrated management coordination, resource and capability management, environmental awareness	Formulation of long- and medium-term plans to achieve knowledge-based objectives	High – essential for determining organizational direction and aligning activities
Contextual Conditions	29 concepts	—	—	—
Managerial Factors	6 concepts	Support for knowledge management cycle, creation of knowledge hubs, managerial awareness of methods, identification of best KM strategies, benchmarking successful organizations, proper process management through technology	Establishing managerial infrastructure for knowledge creation, sharing, and application	Very high – complex flight operations require strong knowledge management systems
Human Resources	4 concepts	Utilization of internal potential, learning capacity, extraction of elite knowledge, HR management focused on talent retention and recruitment	Development and optimal utilization of specialized human capital	Very high – pilots, engineers, and technical experts are strategic assets
Structural-Operational Factors	6 concepts	Documentation of expert knowledge, coordination of resources, strategic knowledge approach, facilitation of interpersonal interaction, process improvement, technological policies for knowledge dissemination	Establishing structures and processes to facilitate knowledge flow	High – requires flexible structure for 24-hour operations and emergency responsiveness
Cultural-Motivational Factors	8 concepts	Knowledge socialization, communication skills, trust and commitment, teamwork, discussion sessions, incentives for learning, creativity and innovation, performance evaluation indicators	Creating a culture of knowledge sharing and teamwork	High – flight safety depends on knowledge exchange among teams
Infrastructural Factors	5 concepts	Up-to-date hardware, leveraging strengths, knowledge databases, marketing information capabilities, lifecycle innovation	Development of ICT infrastructure supporting knowledge systems	Very high – includes reservation, flight management, and communication systems
Intervening Conditions	16 concepts	—	—	—

Environmental Factors	5 concepts	Human rights considerations, social responsibility, political influence, regulations, strong competitors	External factors affecting organizational performance and KM implementation	Very high – sanctions and international aviation regulations (e.g., ICAO, IATA)
Informational Factors	5 concepts	Easy access to knowledge, technological awareness, rapid knowledge transfer, structured information, AI usage	Quality and speed of information flow	High – requires real-time operational data
Human Factors	6 concepts	Top management commitment, knowledge sharing, HR capability, expertise, skilled personnel, employee satisfaction	Quality and motivation of human resources	Very high – critical for safety and service quality
Strategies	18 concepts	—	—	—
Agility	7 concepts	Speed, timely control, environmental intelligence, flexibility, responsiveness, process orientation, expert databases	Enhancing speed and quality of decision-making	Very high – essential for crisis and flight condition management
Knowledge Empowerment	6 concepts	Expert databases, empowerment, cost management, organizational readiness, planning, technological awareness	Systematizing and making knowledge accessible	High – essential for safety and knowledge transfer
Strategic Orientation	5 concepts	Value creation, competitor management, process management, integration of knowledge strategies, conflict management	Optimizing operations and creating economic value	High – improves profitability and service quality
Consequences	11 concepts	—	—	—
Becoming Knowledge-Based	5 concepts	Knowledge-based strategy, technology, structure, culture, marketing	Comprehensive organizational transformation	Very high – sustainable competitive advantage
Organizational Profitability	3 concepts	Business goals achievement, market share growth, service expansion	Improvement of financial and operational performance	Very high – ensures survival and growth
Organizational Sustainability	3 concepts	Sustainable advantage, customer loyalty, organizational credibility	Long-term positioning and stakeholder trust	Very high – essential for domestic and international competitiveness

Figure 1

Paradigmatic Model of the Comprehensive Knowledge-Based Organization Pattern for Iran Air



The comprehensive knowledge-based organization model for Iran Air was designed based on the Strauss and Corbin paradigmatic model and comprises 20 main categories and 105 concepts across six key dimensions. The core phenomenon of this model is termed the "integrated knowledge orientation system," which encompasses the three categories of knowledge-based economy, knowledge-based organization, and knowledge-based development, with a total of 16 concepts. Causal conditions, with 16 concepts in the two categories of competitive requirements and strategic planning, drive the organization toward knowledge-based transformation, while contextual conditions, with 35 concepts in the five categories of managerial factors, human resources, executive-structural factors, cultural-motivational factors, and infrastructural factors, provide the necessary foundation. Intervening conditions, with 16 concepts in the three categories of environmental, informational, and human factors, play a moderating role; the proposed strategies, with 18 concepts in the three categories of agility, knowledge empowerment, and strategic orientation, delineate the course of action; and the model outcomes, with 8 concepts in the three categories of organizational knowledge orientation, organizational profitability, and organizational sustainability, reflect the desired results.

The causal conditions include the two main categories of “competitive requirements” and “strategic planning,” with a total of 16 concepts, which constitute the principal drivers of knowledge-based transformation in Iran Air. Competitive requirements encompass the seven concepts of resilience, organizational adaptability, up-to-dateness, emphasis on research and development, improvement of customer service, a favorable work environment, and nationalism and global trade, all of which have emerged in response to intense competition with international airlines, pressures resulting from sanctions, economic fluctuations, and the demands of high safety standards. Strategic planning includes the nine concepts of a knowledge-based vision, long-term knowledge objectives, competitive strategies, digital transformation planning, knowledge-based risk management, coordination and the establishment of integrated management, management of resources and capabilities, environmental recognition and awareness, and strategic performance evaluation, all of which define a clear pathway for achieving knowledge-oriented goals. These two categories are of very high importance due to the complex and knowledge-intensive nature of the aviation industry and the specific challenges faced by Iran Air in domestic and international environments.

The core phenomenon, the “integrated knowledge orientation system,” constitutes the central nucleus of the knowledge-based organization model and includes the four categories of knowledge-based economy, knowledge-based organization, knowledge-based development, and knowledge-based strategy, with a total of 15 concepts. The category of knowledge-based economy, with the three concepts of knowledge productivity, knowledge-based competitive advantage, and production of goods and services based on knowledge, emphasizes the creation of economic value through the optimal utilization of technical knowledge and operational experience, reflecting the aviation industry’s strong dependence on technical expertise and safety. The category of knowledge-based organization, with the five concepts of support for knowledge management, knowledge-oriented human resources, foresight, intelligent agents, and a flexible organization, seeks to transform the traditional structure into one based on knowledge sharing and continuous learning. The category of knowledge-based development, with the three concepts of intelligent knowledge orientation, a positive approach to knowledge orientation, and trust in knowledge orientation, enables the development of innovative approaches for leveraging knowledge toward continuous performance improvement and effective competition with international companies. Knowledge-based strategy is also identified through the four concepts of the value of knowledge orientation, differentiation through knowledge orientation, demand creation through knowledge orientation, and knowledge-based processes.

The contextual conditions include five categories with a total of 29 concepts that provide the necessary platform for the successful implementation of the knowledge orientation system. Managerial factors, with six concepts including support for the knowledge management cycle and the establishment of knowledge hubs, managers’ awareness of managerial methods, identification of the most effective knowledge management strategy, benchmarking successful organizations and comparing them with internal practices, and proper management of work processes for information exchange through effective technology management, create the managerial infrastructure required to facilitate the production and sharing of knowledge at different organizational levels, which is of very high importance in the complex management of flight operations and coordination among different units. Human resources, with four concepts including utilization of existing potential and individuals’ learning capacity, extraction of elite knowledge, and a human resource management plan focused on talent retention and the recruitment of highly knowledgeable individuals, emphasizes the development and optimal use of specialized human capital such as pilots, aviation engineers, and technical experts as strategic assets. Executive-structural

factors, with six concepts including documentation of the knowledge of experts and retired employees, coordination of human resources and assets to increase organizational efficiency, establishment of a strategic approach to knowledge and an organizational design that facilitates interpersonal interactions, knowledge-based initiatives to reduce duplication and improve processes, technological policies for knowledge collection and dissemination, and emphasis on diverse structural aspects and their dynamism, create appropriate structures and operational processes to facilitate knowledge flow. Cultural-motivational factors, with eight concepts including socialization toward knowledge orientation, communication skills through a systematic communication pattern, trust and commitment to organizational participation, teamwork and work engagement, discussion sessions and exchange of views for knowledge acquisition, incentives for knowledge acquisition, focus on openness through creativity and innovation, establishment of performance evaluation indicators, and reward orientation, emphasize an organizational culture grounded in knowledge sharing. Infrastructural factors, with five concepts including up-to-date hardware, leveraging strengths, establishment, updating, and access to customer, product, and market knowledge databases, marketing information capabilities, end-of-life cycle innovation, and information and communication technology infrastructure, foster the development of the technological foundations required for knowledge-oriented transformation.

The intervening conditions include three categories with a total of 16 concepts that play a moderating role in the process of achieving knowledge-oriented goals. Environmental factors, with five concepts including human rights issues and respect for human dignity, social responsibility and environmental sustainability, the influence of political factors on the organization, laws and regulations, and strong competitors, indicate the external factors affecting organizational performance, which are of very high importance for Iran Air under conditions of sanctions and strict international aviation regulations. Informational factors, with five concepts including easy access to information and knowledge, technological awareness, the capacity for rapid and effective transfer of knowledge across all organizational levels, information structuring, and the use of artificial intelligence in knowledge management, affect the quality and speed of information and knowledge flows, which are essential for real-time and accurate management of flights, weather conditions, and operational decision-making. Human factors, with six concepts including top management commitment, knowledge sharing and exchange, human resource management capability, expertise and skills, competent specialists, and employee satisfaction, determine the quality and motivation of human resources in the sharing and application of knowledge, which is highly significant given the aviation industry’s strong dependence on staff expertise and experience to ensure safety and service quality.

The proposed strategies include three categories with a total of 18 concepts that define the course of action for realizing the knowledge orientation system. Agility, with seven concepts including speed in task execution, timely supervision and control, environmental intelligence, flexibility and responsiveness, process-based knowledge, and a database of experts, seeks to improve the speed and accuracy of decision-making under changing conditions, which is essential for immediate response to changes in flight conditions and crisis management in aviation operations. Knowledge empowerment, with six concepts including a database of experts, empowerment of human resources, improvement of organizational readiness, planning and cost management, and making organizational knowledge and experience accessible, facilitates the preservation of safety standards and the transfer of knowledge to new generations of employees. Strategic orientation, with five concepts including value creation, competitor management, process management, strategic integration of knowledge, and conflict management, makes it possible to optimize operations, reduce costs, and create economic value through the application of

knowledge, which is essential for improving profitability, service quality, and passenger satisfaction in a competitive environment.

The model outcomes include three categories with a total of 11 concepts that indicate the desirable results derived from successful implementation of the model. Organizational knowledge orientation, with five concepts including knowledge-based strategy, knowledge-based technology, knowledge-based structure, knowledge-based culture, and knowledge-based marketing, reflects the comprehensive transformation of all organizational dimensions toward knowledge orientation and the systematic use of knowledge, which is essential for achieving the overall goals of organizational transformation and creating sustainable competitive advantage. Organizational profitability, with three concepts including achievement of business objectives, greater market share, and provision of expanded services, leads to improved financial and performance indicators, which is of very high importance for the company's financial sustainability, survival, and growth in a competitive environment. Organizational sustainability, with three concepts including sustainable relative advantage, customer satisfaction and loyalty, and the development of organizational credibility, enables the achievement of long-term goals and the establishment of a stable market position, which is significant for Iran Air's effective competition in domestic and international markets and for gaining passenger trust.

Discussion and Conclusion

The findings of this study led to the development of a comprehensive and integrated model of a knowledge-based organization in the aviation sector, structured around the paradigmatic framework of causal conditions, core phenomenon, contextual conditions, intervening conditions, strategies, and outcomes. The results indicate that the "integrated knowledge orientation system" functions as the central mechanism through which organizational transformation toward knowledge-based practices is realized. This core phenomenon, encompassing dimensions such as knowledge-based economy, knowledge-based organization, knowledge-based development, and knowledge-based strategy, reflects a systemic and multi-layered understanding of knowledge as a strategic asset. This finding aligns with prior research emphasizing the centrality of knowledge integration and strategic alignment in achieving sustainable competitive advantage in knowledge-intensive environments [1, 2]. Moreover, the identification of knowledge orientation as a unifying construct supports the argument that knowledge management must transcend isolated initiatives and instead be embedded within the organization's strategic and operational fabric [27, 28].

The analysis of causal conditions revealed that competitive requirements and strategic planning are the primary drivers of knowledge-based transformation in the airline context. The emphasis on resilience, adaptability, research and development, and customer service improvement highlights the increasing pressure on organizations to respond to dynamic environmental conditions. These findings are consistent with studies demonstrating that external competitive forces and internal strategic orientation significantly influence the adoption of knowledge management practices [22, 34]. Furthermore, the role of strategic planning, including digital transformation and knowledge-based risk management, confirms the necessity of aligning long-term organizational goals with knowledge-centric strategies [18]. This alignment ensures that knowledge management initiatives contribute directly to organizational performance and sustainability.

The contextual conditions identified in this study underscore the importance of managerial, human, structural, cultural, and infrastructural factors in facilitating the implementation of knowledge-based systems. The results demonstrate that

managerial support, the establishment of knowledge hubs, and the adoption of effective management practices are critical for enabling knowledge creation and sharing. This is in line with previous research highlighting the role of leadership and management in fostering a knowledge-oriented culture and supporting KM initiatives [8, 19]. Additionally, the significance of human resources as carriers of knowledge is reinforced by the findings, which emphasize the need for talent development, knowledge extraction, and capacity building. These results corroborate the findings of Salamzadeh et al., who argue that human capital and knowledge-sharing behaviors are key determinants of organizational performance in knowledge-based settings [11].

The structural and cultural dimensions identified in this study further highlight the complexity of knowledge-based transformation. Flexible organizational structures and effective communication systems were found to facilitate knowledge flows and enhance collaboration, supporting earlier studies that emphasize the importance of structural alignment and organizational design in KM implementation [15, 16]. Similarly, the role of organizational culture in promoting trust, teamwork, and knowledge sharing aligns with existing literature indicating that cultural factors significantly influence the success of KM initiatives [7, 9]. The integration of these factors within the model demonstrates that knowledge-based transformation requires a holistic approach that addresses multiple organizational dimensions simultaneously.

The intervening conditions identified in this study, including environmental, informational, and human factors, were found to play a moderating role in the effectiveness of knowledge-based transformation. The influence of external factors such as regulatory requirements, political conditions, and competitive pressures highlights the need for organizations to remain adaptable and responsive to their environment. This finding is consistent with the literature on knowledge management, which emphasizes the impact of external uncertainties on organizational strategies and performance [24]. Additionally, the importance of information quality, accessibility, and technological awareness underscores the role of information systems and digital technologies in supporting KM processes [4, 21]. The human dimension, including leadership commitment and employee motivation, further reinforces the importance of aligning organizational behavior with knowledge-oriented goals [6, 20].

The strategies identified in this study—agility, knowledge empowerment, and strategic orientation—provide a clear roadmap for implementing knowledge-based transformation. The emphasis on agility reflects the need for organizations to respond quickly to changing conditions and make timely decisions, particularly in the aviation industry where operational efficiency and safety are critical. This finding aligns with research highlighting the role of dynamic capabilities and organizational flexibility in enhancing performance in uncertain environments [35]. Knowledge empowerment, through the development of expert databases and the systematization of organizational knowledge, supports the argument that knowledge accessibility and dissemination are essential for effective KM implementation [3, 13]. Furthermore, the focus on strategic orientation, including value creation and competitor management, underscores the importance of integrating KM with broader organizational strategies to achieve competitive advantage [1].

The outcomes of the model demonstrate the tangible benefits of knowledge-based transformation, including enhanced organizational performance, profitability, and sustainability. The finding that knowledge orientation leads to improved financial and operational outcomes is consistent with prior studies linking KM practices to organizational performance and innovation [12, 36]. The emphasis on sustainability and customer satisfaction further highlights the long-term value of

knowledge-based strategies in building organizational resilience and stakeholder trust. These results support the view that knowledge management serves as a critical enabler of organizational success in complex and competitive environments [31].

Overall, the findings of this study contribute to the existing body of knowledge by providing a comprehensive and context-specific model of a knowledge-based organization in the aviation industry. The integration of multiple dimensions within the model reflects the complexity of knowledge-based transformation and offers practical insights for organizations seeking to enhance their knowledge capabilities. The use of grounded theory as a methodological framework further strengthens the validity of the findings, as it allows for the identification of relationships based on empirical data. This approach is consistent with previous studies that emphasize the importance of data-driven model development in understanding complex organizational phenomena [27, 37].

The study also highlights the importance of aligning knowledge management with emerging technological trends, such as artificial intelligence and digital transformation. The integration of AI into KM systems enhances the organization's ability to process information, generate insights, and support decision-making processes, thereby improving overall performance [4, 5]. This finding underscores the need for organizations to invest in technological infrastructure and develop capabilities that support knowledge-based transformation. Additionally, the role of organizational learning and innovation in driving knowledge-based transformation is reinforced by the findings, which demonstrate the importance of continuous learning and adaptation in achieving sustainable competitive advantage [2, 26].

The limitations of this study should be acknowledged. First, the research was conducted within a single organizational context, which may limit the generalizability of the findings to other industries or organizations with different characteristics. Second, the qualitative nature of the study, while providing in-depth insights, may be subject to researcher bias and limitations in data interpretation. Third, the reliance on expert opinions and interviews may not fully capture the perspectives of all stakeholders, particularly operational-level employees. Additionally, external environmental factors, such as economic fluctuations and regulatory changes, were considered but not quantitatively measured, which may affect the robustness of the findings.

Future research should aim to validate and extend the proposed model through quantitative methods and empirical testing across different organizational contexts. Comparative studies across industries could provide valuable insights into the applicability and adaptability of the model. Additionally, future studies may explore the role of emerging technologies, such as artificial intelligence and big data analytics, in enhancing knowledge management practices. Longitudinal research designs could also be employed to examine the dynamic nature of knowledge-based transformation over time. Furthermore, investigating the interaction between organizational culture, leadership styles, and knowledge management outcomes could provide deeper insights into the mechanisms underlying successful implementation.

From a practical perspective, organizations seeking to transition toward knowledge-based models should adopt a holistic approach that integrates strategic planning, technological investment, and human resource development. Managers should prioritize the creation of a knowledge-sharing culture, supported by appropriate incentives and leadership practices. Investment in information technology infrastructure and knowledge management systems is essential for facilitating knowledge flows and supporting decision-making processes. Additionally, organizations should focus on developing the skills and capabilities of their workforce through continuous training and learning initiatives. Establishing clear strategies and

performance evaluation mechanisms can further enhance the effectiveness of KM initiatives and ensure alignment with organizational goals.

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Authors' Contributions

All authors equally contributed to this study.

Declaration of Interest

The authors of this article declared no conflict of interest.

Ethical Considerations

The study protocol adhered to the principles outlined in the Helsinki Declaration, which provides guidelines for ethical research involving human participants. Written consent was obtained from all participants in the study.

Transparency of Data

In accordance with the principles of transparency and open research, we declare that all data and materials used in this study are available upon request.

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