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DIGITAL TRANSFORMATION AND ADMINISTRATION INNOVATION

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Proposing a Structural Model of Digital Leadership in the Banking Industry

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Abstract

The aim of the present study was to propose a structural model of digital leadership in the banking industry. This research employed a qualitative method and was applied in nature. The participants included experts consisting of university professors specializing in digitalization within the banking industry. Interviews were conducted with 17 individuals using purposive sampling until theoretical saturation was achieved. The research instrument was semi-structured interviews. The validity of the interviews was examined through face validity, and their reliability was assessed using inter-coder agreement. Data analysis was performed using coding techniques. Additionally, to identify the causal relationships among the components of digital leadership in the banking industry, the Structural Interpretive Modeling (SEM) method was used. The results revealed that digital leadership in the banking industry consists of 13 main components organized into four levels. At the first level, components such as collaborative and digital networking leadership, agile and adaptive digital leadership, digital leadership for customer experience improvement, and leadership in digital change management were identified as key and independent factors in digital processes. These components have high leverage and can rapidly generate significant changes within the organization. At the second level, components such as innovation and change leadership, cultural and human-centered leadership, and data-driven leadership were identified. The third level included leadership in the areas of cybersecurity and privacy. The fourth level was comprised of strategic digital leadership, which showed low influence and high dependency on other components. It can be concluded that the structural model of digital leadership in the banking industry could have significant implications for the country's banking system. Emphasis on digital leadership should be placed on the first level, which includes the key and independent factors in digital leadership.

Keywords: Digital Leadership, Banking, Management, Leadership.

1. Introduction

Today, countries around the world are pursuing innovation as a strategy to increase productivity and improve economic conditions. Naturally, what enables an organization to seize new opportunities is innovation at all levels. Being innovative helps organizations adapt to a turbulent external environment characterized by complexity and change. Therefore, to achieve superior performance in such environments, organizations must maximize the use of their internal resources (Wu & Hu, 2018).

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Drucker (2001) emphasized human capital as the most important source of competitive advantage and performance improvement, suggesting that digital leadership can generate new knowledge and enhance innovation capabilities and organizational performance. The ability of digital leadership to influence organizational processes and outcomes is considered a vital competence (Oliveira et al., 2021). Organizations must act as expert social communities in creating and transmitting digital leadership; in other words, they should develop unique capabilities enabling better knowledge sharing and management than what is available in the wider society (Arabiun et al., 2024).

Digital transformation is regarded as a driving force that offers solutions to current challenges in the banking sector. Core elements of digital transformation—such as leadership, digital processes, digital transformation skills, digital strategies, implementation of digital technologies, and customer-centric approaches—are seen as influential across levels of digital maturity (De Araujo et al., 2021). Digitalization involves the intentional use of inbound and outbound knowledge flows to accelerate market innovation and extend internal knowledge into external markets, fundamentally shifting paradigms toward open innovation, which emphasizes that innovation is not limited to specific people or topics but should be widely developed and socialized (Anwar & Saraih, 2024; Arabiun et al., 2024; Wilson Iii et al., 2004).

Digital technologies have provided a foundational business platform that has rapidly expanded internet-based commerce. One of the key virtual applications is digital trade, which has revolutionized business-customer interactions and captured a significant portion of commercial exchanges (Benitez et al., 2022). Digital trade reflects the tangible outcome of the information and communication technology revolution in the economy and is expanding rapidly due to its substantial benefits. The use of digital technology in commerce dates back to the late 20th century, when major companies used closed computer networks to exchange commercial data. At that time, electronic commerce was synonymous with electronic data interchange (EDI). The advent and growth of the internet created vast opportunities for the development of e-commerce infrastructures and applications (Zare & Pashazadeh, 2023).

According to the World Trade Organization (WTO), e-commerce refers to the production, distribution, marketing, sale, or delivery of goods and services through internet-based services. The first requirement for e-commerce is public awareness, which must be accompanied by proper education. Users must be familiar with the necessary infrastructure and regulatory frameworks, which are endorsed by e-government platforms. Digital leadership presents a valuable opportunity to foster and create digital innovations and promote vitality in the information society (Anwar & Saraih, 2024).

Organizations today seek new leadership models aligned with digital pathways and the emergence of agile, younger leaders. New social conditions necessitate new leadership styles essential for initiating and sustaining the transition toward knowledge-based societies. In the digital era, leadership requires new mindsets, skills, and knowledge that respond to social changes and are shaped through unique professional experiences (Wilson Iii et al., 2004). As a model for modern leadership, the digital leader must always be willing to advance their knowledge and skills, treating continuous learning as a fundamental principle to maintain a competitive edge (Kırmaz, 2010).

Given the critical role of leaders in guiding and enhancing the effectiveness of digital knowledge initiatives, digital leadership is an essential organizational factor. Leaders can create environments that enable employees to apply, strengthen, and develop digital knowledge competencies, thereby producing personal knowledge resources and facilitating access to relevant knowledge (Gholichli et al., 2020). However, certain leadership behaviors may hinder digital leadership by fostering highly competitive climates rather than collaborative knowledge-sharing environments. This may result in negative organizational attitudes toward digital leadership. Hence, investigating the role of leaders within specific management styles and practices is crucial (Tayal et al., 2022).

Studies on digital leadership strategies highlight both "hard" and "soft" dimensions: the hard aspects focus on technology, while the soft aspects emphasize social dynamics (Nguyen et al., 2019). The "hard" view suggests that adopting and using diverse IT tools is key to enabling digital leadership in organizations (Mason & Pauleen, 2003). Digital leadership projects often involve large volumes of knowledge processed through various IT platforms, such as data mining, data warehousing, and groupware systems (Malhotra, 2020). In contrast, the "soft" approach focuses on cultivating social relationships in the organization that encourage information exchange and sustained digital leadership motivation (Pambreni et al., 2019).

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According to Lee and Choi (2003), these social factors include community, organizational structure, and workforce characteristics. As these elements become integrated into workplace culture, they enhance organizational learning and competitive advantage, making them difficult for competitors to replicate (Gold et al., 2001).

Digital transformation in banking extends beyond shifting from traditional banking to digital ecosystems. Digital technologies are critical for maintaining the efficiency of business processes. Their impact transforms products, organizational structures, and automation processes (Fard et al., 2021). Banks today operate in highly competitive environments where many rivals vie for customers. This is particularly true for banks, as the largest financial institutions. The 21st century has seen rapid technological, transportation, and communication advances that have significantly influenced and accelerated developments in banking.

In today's banking industry, the foremost principle for gaining market share is prioritizing digital leadership and understanding its goals and strategies. Organizations, especially banks, cannot sustain themselves without aligning with leadership goals and strategies. Such alignment boosts customer satisfaction and loyalty, enhancing the bank's reputation, profitability, and growth (Malhotra, 2020). Digital leadership—like modern banking, consumer behavior orientation, competitive awareness, and superior services—plays a pivotal role in customer acquisition and overall bank growth. Properly formulated leadership strategies can retain existing clients and attract new ones, strengthening customer loyalty and transforming the banking sector. Strategic marketing approaches contribute to reputation building and customer engagement, reinforcing the importance of digital leadership in fostering bank growth and profitability.

Several studies have investigated aspects of digital leadership. Zare et al. (2022) concluded that digital leadership serves as the initiator and driver of digital transformation. Therefore, digital leaders should possess traits and behaviors that facilitate organizational transformation (Zare & Pashazadeh, 2023). Fard et al. (2021) developed a model for promoting digital entrepreneurship in small and medium-sized knowledge-based enterprises. Their findings indicated that contextual factors had the most influence, while structural factors were most affected in advancing digital entrepreneurship (Fard et al., 2021).

In light of the above, this study is both important and necessary for service providers—particularly in the banking industry—to enhance profitability and growth. Its findings are applicable to various industries, especially banking, and are useful for academics and students engaged in research projects. The insights gained may contribute to improving digital leadership models in banking, allowing stakeholders to assess current conditions, identify deficiencies, and implement strategies to strengthen digital leadership. Accordingly, the primary aim of this study is to propose a structural model of digital leadership in the banking industry.

2. Methods and Materials

The present study employed a qualitative research design and was applied in terms of its objective. The participants consisted of experts, including university faculty members specializing in digitalization within the banking industry. Additionally, senior managers and deputies from various banks—including Tejarat, Mellat, Sepah, Refah, Maskan, Keshavarzi, Parsian, Pasargad, Eghtesad Novin, and Saman—were interviewed as experts until data saturation was achieved. A purposive sampling method was utilized. Accordingly, a total of 17 interviews were conducted until theoretical saturation was reached.

Participant selection criteria included the following: having at least a master's degree, a minimum of five years of work experience in the banking industry, and substantial knowledge in the field of digital sciences. The data collection instrument was semi-structured interviews. The validity of the interview guide was assessed using face validity, while reliability was verified through the inter-coder agreement coefficient. For data analysis, the coding method was employed. Additionally, after extracting the experts' views, the Structural Interpretive Modeling (SEM) approach was applied to determine the causal relationships among the components of digital leadership in the banking industry.

3. Findings and Results

Table 1 presents selected demographic characteristics of the study participants.

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Table 1. Demographic Characteristics of Experts

Demographic Characteristics	Frequency	Percentage
Gender		
Male	14	82.0%
Female	3	18.0%
Age		
Under 35 years	8	47.0%
35 to 45 years	7	42.0%
Over 45 years	2	11.0%
Education Level		
Master's degree	10	58.0%
Ph.D.	7	42.0%
Work Experience		
10 to 20 years	7	42.0%
More than 20 years	10	58.0%
Total	17	100.0%

In the data analysis phase, 191 initial codes were extracted from the 17 conducted interviews. Due to the presence of overlapping and semantically similar codes, they were grouped accordingly. After merging synonymous codes, a total of 101 distinct codes were identified.

In the next stage, the main and sub-categories of the codes were named. For each group of extracted codes from the interview transcripts, a specific label was assigned. Ultimately, through the systematic examination and classification of descriptive codes derived from the interviews, 101 indicators were identified and categorized based on their semantic similarity and conceptual proximity (Table 2).

Table 2. Final Coding of Digital Banking Leadership: Dimensions, Components, and Indicators

Dimension	Component	Indicator
Strategic Digital Leadership	Competency in developing and implementing digital strategies	• Percentage of strategic digital goals achieved in the organization
		• Time spent developing and executing digital strategies
		• Revenue growth from digital services compared to traditional services
		• Number of successfully implemented digital projects within a set period
	Long-term decision-making focused on digital transformation	• Percentage of resources allocated to digital projects in long-term strategy
		• Number of key decisions aligned with digital transformation in strategic planning
		• Percentage of long-term changes improving digital efficiency
	Alignment of business objectives with digital transformation	• Percentage of business objectives directly aligned with digital strategies
		• Alignment of digital strategies with organizational vision and macro objectives
		• Number of strategic reviews based on digital analytics and market needs
Innovation and Change Leadership	Support for innovative projects and technological research	• Percentage of investment in digital innovation projects
		• Number of research and pilot projects in emerging technologies
		• Number of research outputs (e.g., articles, patents, new digital products)
	Acceptance of digital change and transformation	• Speed of adoption of new technologies
		• Percentage of banking processes digitized
		• Level of resistance and organizational challenges to digital change
	Encouraging experimentation and creativity in processes	• Percentage of processes optimized through digital experimentation
		• Number of innovative ideas successfully piloted
Cultural and Human-Centric Leadership	Managing cultural change in the organization	• Number of training programs on digital cultural transformation
		• Level of employee participation in digital and innovation processes

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	Enhancing employee digital skills	• Percentage of employees trained in digital skills • Number of new digital skills integrated into teams • Percentage of teams fully proficient in new digital tools and platforms
	Promoting flexibility and collaboration in digital work culture	• Level of digital interaction among teams/departments • Number of cross-unit collaborative projects • Increase in digital collaboration platform usage
Data-Driven Leadership	Competency in using data analytics for decision-making	• Percentage of key decisions based on data • Number of analytics tools effectively used in decision-making • Improvement in decisions based on micro/macro data
	Use of AI and advanced analytics to optimize services	• Percentage of services using AI or advanced algorithms • Number of service improvements resulting from AI use • Reduction in cost and time due to AI in services
	Understanding and use of Big Data tools	• Number of strategic decisions based on Big Data • Degree of Big Data platform usage in digital banking
Customer-Centric Digital Leadership	Designing digital experiences based on customer needs	• Customer satisfaction with digital experiences • Number of customer requests for service improvements • Increase in digital platform interaction by customers
	Using customer feedback to improve services	• Number of customer feedback reports collected • Percentage of services improved based on feedback • Impact of customer-driven changes
	Offering services aligned with market trends	• Number of new digital services rapidly launched • Percentage of services matching emerging market trends • Customer adoption rate of new digital services
Technology and Innovation Leadership	Use of new technologies to improve banking processes	• Number of processes optimized with new technologies • Cost/time reductions due to technology use
	Identifying, evaluating, adopting emerging tech (e.g., AI, blockchain, ML)	• Number of technologies identified and evaluated • Percentage implemented in banking services • Financial gains from technology adoption
Financial and Entrepreneurial Digital Leadership	Modeling digital revenue and innovative financial services	• Number of digital business models operationalized • Percentage of revenue from digital financial services • Revenue growth from digital innovations
	Designing and implementing digital business models	• Number of newly launched digital business models • Percentage of revenue from new digital businesses • Innovation level in implemented models
	Creating new digital financial markets	• Number of new digital financial markets • Percentage of markets attracting new clients • Digital market share vs. traditional markets
Sustainable and Ethical Digital Leadership	Ensuring data privacy and customer information protection	• Number of data privacy breaches • Customer satisfaction with data security • Percentage of digital processes complying with global standards
	Enhancing transparency in digital decision-making	• Transparency in digital decisions/reports • Number of digital tools for monitoring transparency • Stakeholder acceptance of digital decisions
	Promoting accountability and transparency through digital means	• Number of financial transparency reports generated digitally • Percentage of banking processes improved in transparency/accountability • Customer trust gained through digital transparency
Collaborative and Networked Digital Leadership	Building networks with startups and tech firms	• Number of strategic partnerships with startups/tech firms • Percentage of projects executed with startup collaboration • Impact of collaboration on service development
	Strategic alliances with banks, fintechs, and regulators	• Number of new partnerships with fintechs/regulators • Percentage of digital services utilizing strategic partnerships • Number of services developed through regulatory/fintech collaboration
	Developing open collaboration models	• Number of open collaboration models implemented • Usage rate of APIs and open collaboration platforms • Success rate of open innovation projects

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Agile and Adaptive Digital Leadership	Implementing agile organizational structures	• Percentage of agile organizational setups • Number of agile, autonomous teams • Speed of digital process changes due to agile structures
	Rapid strategy adjustment to market/customer needs	• Average time to implement strategic change • Number of strategies implemented quickly • Strategic flexibility in responding to rapid changes
	Leading agile and autonomous teams in banking	• Number of agile, self-led banking teams • Success rate of agile teams in digital projects
Customer Experience-Driven Digital Leadership	UX-based banking service design and delivery	• Customer satisfaction with digital UX • Number of services designed with UX principles • Usage increase due to improved UX
	Using technology to enhance customer experience	• Number of technologies used to improve customer experience • Customer satisfaction increase from tech-enhanced services • Growth in customer interaction with digital platforms
Cybersecurity and Privacy Leadership	Cyber risk management and mitigation	• Number of identified and resolved cyberattacks • Reduction in financial losses due to cyber threats • Percentage of employees trained in cybersecurity
	Use of advanced security technologies	• Number of security layers implemented • Reduction in digital banking security breaches • Usage of encryption, two-factor authentication, etc.
Digital Change Management Leadership	Leading organizational digital transformation	• Success rate of digital change projects • Percentage of staff accepting digital changes • Average adaptation time to digital changes
	Managing structural and cultural change during transformation	• Percentage of employees embracing structural/cultural change • Number of training/organizational adaptation programs • Success rate of combined structural/cultural changes

The results from Table 2 indicate that digital leadership in the banking industry comprises 13 core concepts:

1. Strategic Digital Leadership
2. Innovation and Change Leadership
3. Cultural and Human-Centric Leadership
4. Data-Driven Leadership
5. Customer-Centric Digital Leadership
6. Technology and Innovation Leadership
7. Financial and Digital Entrepreneurship Leadership
8. Sustainable and Ethical Digital Leadership
9. Collaborative and Networked Digital Leadership
10. Agile and Adaptive Digital Leadership
11. Digital Leadership for Enhancing Customer Experience
12. Cybersecurity and Privacy Leadership
13. Digital Change Management Leadership

To determine the causal relationships among these components of digital leadership in the banking industry, Structural Interpretive Modeling (ISM) was used.

The modeling logic is based on non-parametric methods and relies on mode frequency. That is, the symbol entered into the table is the one most frequently confirmed by the experts. Table 3 presents the Structural Self-Interaction Matrix (SSIM) based on expert opinions.

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Table 3. Structural Self-Interaction Matrix

Goals	Component	13	12	11	10	9	8	7	6	5	4	3	2	1
1	Innovation and Change Leadership	A	A	V	A	O	V	O	V	O	V	O	A	
2	Cultural and Human-Centric Leadership	A	O	A	O	O	O	O	V	O	V	O		
3	Data-Driven Leadership	O	O	O	A	X	V	O	V	A	O			
4	Strategic Digital Leadership	A	A	A	A	O	A	O	A	A				
5	Collaborative and Networked Leadership	O	O	V	V	O	V	O	V					
6	Customer-Centric Digital Leadership	A	A	X	A	X	V	A						
7	Agile and Adaptive Leadership	O	O	O	V	O	O							
8	Technology and Innovation Leadership	O	O	A	A	X								
9	Financial and Digital Entrepreneurship Leadership	O	O	O	O									
10	Cybersecurity and Privacy Leadership	A	A	V										
11	Sustainable and Ethical Digital Leadership	A	A											
12	Leadership for Enhancing Customer Experience	O												
13	Digital Change Management Leadership													

After forming the initial reachability matrix, it is necessary to ensure internal consistency. For example, if variable 1 leads to variable 2 and variable 2 leads to variable 3, then variable 1 must also lead to variable 3. If this relationship does not exist in the initial matrix, it must be corrected by inserting the missing relationships. Several techniques are available to achieve consistency; in this study, mathematical logic was applied. Specifically, the initial reachability matrix is raised to the power of (K + 1). Matrix exponentiation follows Boolean algebra rules, meaning: 1 + 1 = 1 and 1 × 1 = 1 (Azar et al., 2010). The final reachability matrix is presented in Table 4. The asterisk (*) indicates a value that was initially 0 and became 1 after enforcing consistency.

Table 4. Final Reachability Matrix

Strategic Goals	13	12	11	10	9	8	7	6	5	4	3	2	1	Driving Power
1	0	0	1	0	1*	1	0	1	0	1	1*	1*	1	8
2	0	0	1*	0	1*	1*	0	1	0	1	1*	1	1	8
3	0	0	1*	0	1	1	0	1	0	1*	1	1*	1*	8
4	0	0	0	0	0	0	0	0	0	1	0	0	0	1
5	0	0	1	1	1*	1	0	1	1	1	1	1*	1*	10
6	0	0	1	0	1	1	0	1	0	1	1*	1*	1*	8
7	0	0	1*	1	1*	1*	1	1	0	1*	1*	1*	1*	10
8	0	0	1*	0	1	1	0	1*	0	1	1*	1*	1*	8
9	0	0	1*		1	1	0	1	0	1*	1	1*	1*	8
10	0	0	1	1	1*	1	0	1	0	1	1	1*	1	9
11	0	0	1	0	1*	1	0	1	0	1	1*	1	1*	8
12	0	1	1	1	1*	1*	0	1	0	1	1*	1*	1	10
13	1	0	1	1	1*	1*	0	1	0	1	1*	1	1	10
Dependence	1	1	12	5	12	12	1	12	1	13	12	12	12	

Finally, the model components are prioritized and leveled as shown in Table 5.

Table 5. Level Partitioning Table

Component	ID	Reachability Set (Vi)A	Antecedent Set (Vi)R	Intersection Set (Vi∩R)	Level
Innovation and Change Leadership	1	1–2–3–4–6–8–9–11	1–2–3–5–6–7–8–9–10–11–12–13	1–2–3–6–8–9–11	Two
Cultural and Human-Centric Leadership	2	1–2–3–4–6–8–9–11	1–2–3–5–6–7–8–9–10–11–12–13	1–2–3–6–8–9–11	Two
Data-Driven Leadership	3	1–2–3–4–6–8–9–11	1–2–3–5–6–7–8–9–10–11–12–13	1–2–3–6–8–9–11	Two
Strategic Digital Leadership	4	4	1–2–3–4–5–6–7–8–9–10–11–12–13	4	One
Collaborative and Networked Leadership	5	1–2–3–4–5–6–8–9–10–11	5	5	Four
Customer-Centric Digital Leadership	6	1–2–3–4–6–8–9–11	1–2–3–5–6–7–8–9–10–11–12–13	1–2–3–6–8–9–11	Two
Agile and Adaptive Leadership	7	1–2–3–4–6–7–8–9–10–11	7	7	Four

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Technology and Innovation Leadership	8	1–2–3–4–6–8–9–11	1–2–3–5–6–7–8–9–10–11–12–13	1–2–3–6–8–9–11	Two
Financial and Digital Entrepreneurship Leadership	9	1–2–3–4–6–8–9–11	1–2–3–5–6–7–8–9–10–11–12–13	1–2–3–6–8–9–11	Two
Cybersecurity and Privacy Leadership	10	1–2–3–4–6–8–9–10–11	5–7–10–12–13	10	Three
Sustainable and Ethical Digital Leadership	11	1–2–3–4–6–8–9–11	1–2–3–5–6–7–8–9–10–11–12–13	1–2–3–6–8–9–11	Two
Digital Leadership for Customer Experience	12	1–2–3–4–6–8–9–10–11–12	12	12	Four
Digital Change Management Leadership	13	1–2–3–4–6–8–9–10–11–13	13	13	Four

According to Table 5, when the reachability and intersection sets are equal, the element is placed at the final level (Level Four). After determining the relationships and hierarchy, the elements are structured top to bottom in a model based on levels. Inter-component influence is then established using the final reachability matrix. Accordingly, the Digital Leadership Model in the Banking Industry is presented in Figure 1.

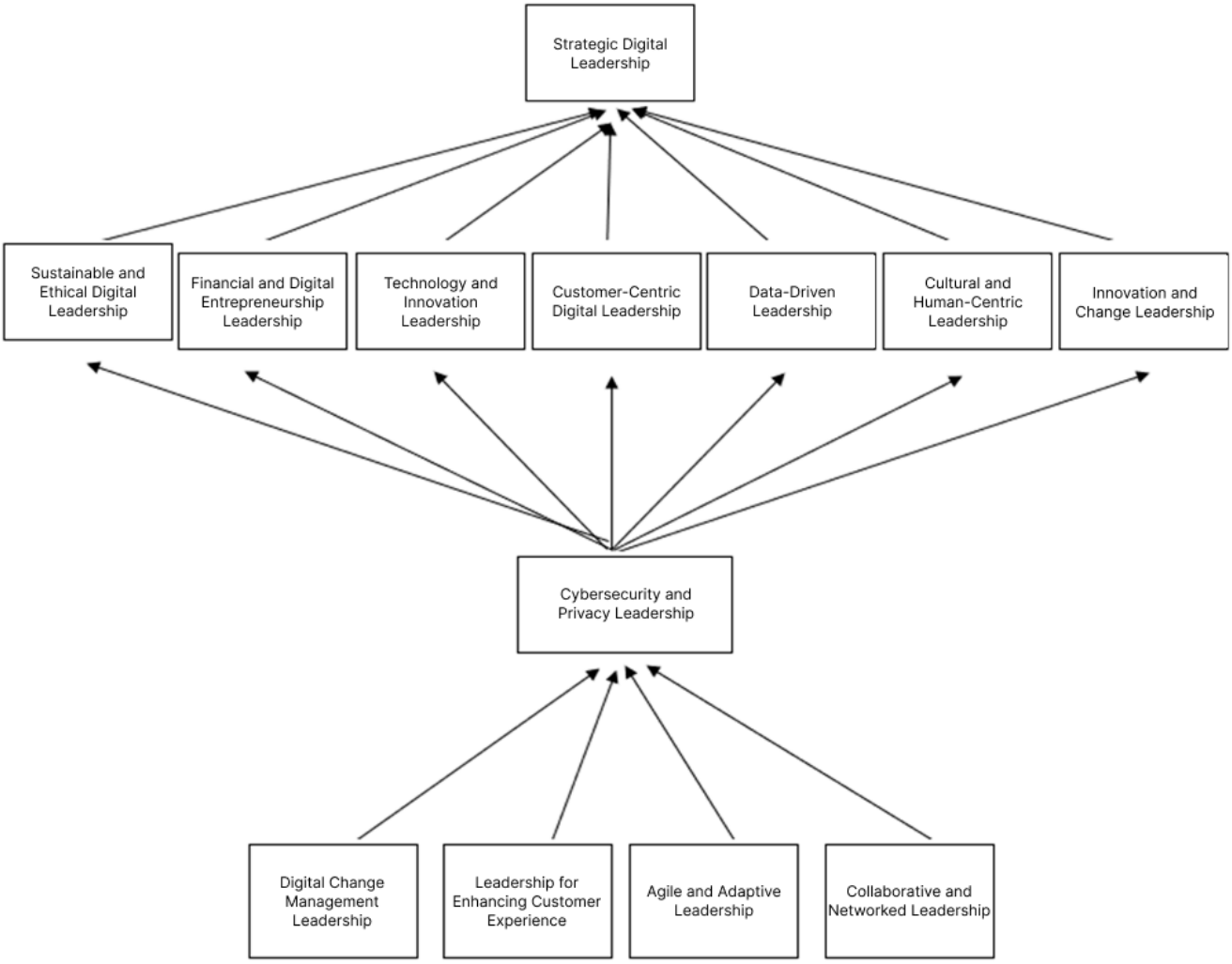


Figure 1. Digital Leadership Model in the Banking Industry

In the Interpretive Structural Modeling (ISM) framework, the interrelationships and mutual influences among criteria—as well as the connections across different hierarchical levels—are clearly illustrated. This facilitates a better understanding of the decision-making landscape for managers. To identify the key criteria, the power of influence and the level of dependence of the variables are determined through the final reachability matrix. Table 6 presents the influence power–dependence levels for the variables under study.

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Table 6. Influence Power and Dependence Level of Model Variables

Component	ID	Dependence Level	Influence Power	Level
Innovation and Change Leadership	1	12	8	Two
Cultural and Human-Centric Leadership	2	12	8	Two
Data-Driven Leadership	3	12	8	Two
Strategic Digital Leadership	4	13	1	One
Collaborative and Networked Leadership	5	1	10	Four
Customer-Centric Digital Leadership	6	12	8	Two
Agile and Adaptive Digital Leadership	7	1	10	Four
Technology and Innovation Leadership	8	12	8	Two
Financial and Digital Entrepreneurship Leadership	9	12	8	Two
Cybersecurity and Privacy Leadership	10	5	9	Three
Sustainable and Ethical Digital Leadership	11	12	8	Two
Digital Leadership for Enhancing Customer Experience	12	1	10	Four
Digital Change Management Leadership	13	1	10	Four

The results from Table 6 indicate the presence of four final levels for digital leadership in the banking industry. To identify key criteria, the final reachability matrix is used to calculate the influence–dependence values, which are then categorized into one of four quadrants: Autonomous (I), Dependent (II), Linkage (III), and Independent (IV). This classification is depicted in Figure 2.

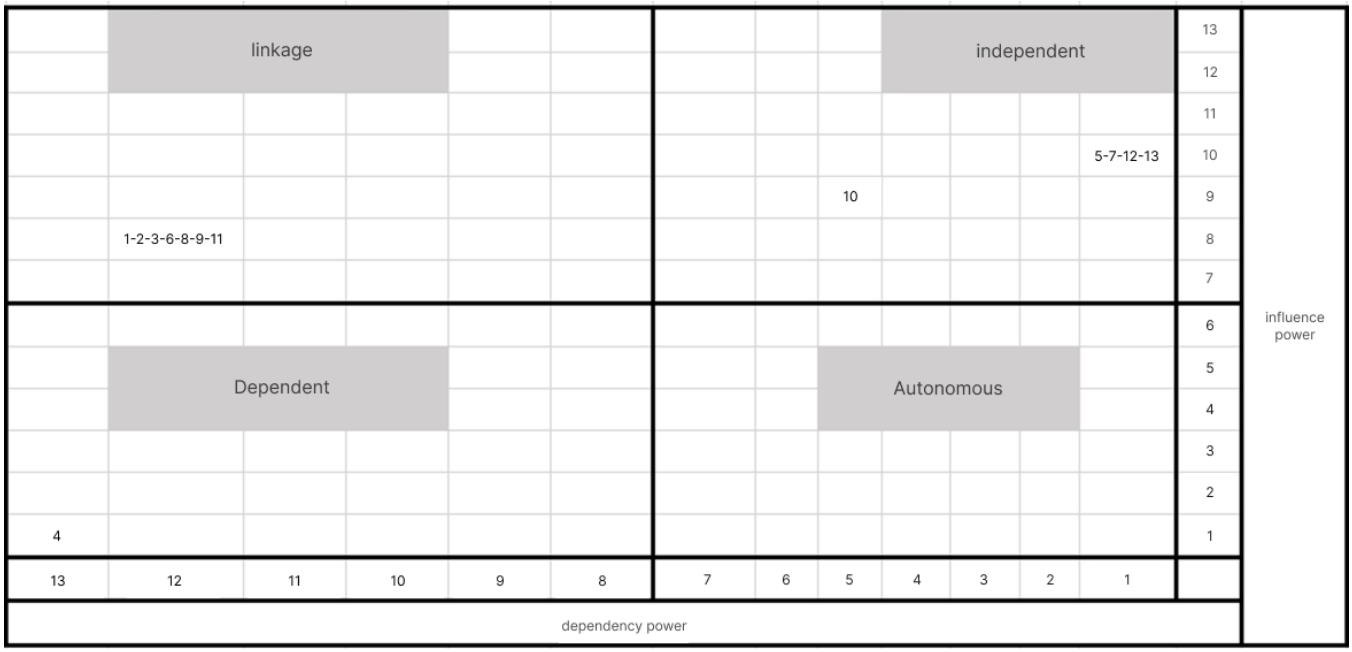


Figure 2. Influence–Dependence Graph

In the influence–dependence analysis using the ISM model, the reciprocal and causal relationships among the criteria can be clearly identified. Table 6 presents the dependence and influence levels of various variables, which can then be categorized into four distinct groups based on this analysis:

- Autonomous variables are those with low influence and low dependence. They exhibit limited interactions with other criteria.
- Dependent variables are characterized by high dependence but low influence, indicating that they are affected by many other variables yet exert little impact themselves.
- Linkage variables possess both high influence and high dependence, meaning changes in these variables can significantly affect the system, and they are also highly sensitive to changes in other variables. These tend to be unstable and interactive.

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- Independent (or key) variables are those with high influence but low dependence. They exert a substantial effect on the system and can influence multiple other components without being significantly influenced in return. These are typically the most strategic variables in the system.

This analysis provides a critical understanding of how digital leadership components function within the banking sector, allowing decision-makers to identify where to prioritize transformation efforts for the most systemic impact.

4. Discussion and Conclusion

The aim of the present study was to propose a structural model of digital leadership in the banking industry. The results revealed that digital leadership in this context comprises 13 core constructs: (1) Strategic Digital Leadership, (2) Innovation and Change Leadership, (3) Cultural and Human-Centric Leadership, (4) Data-Driven Leadership, (5) Customer-Centric Digital Leadership, (6) Technology and Innovation Leadership, (7) Financial and Digital Entrepreneurship Leadership, (8) Sustainable and Ethical Digital Leadership, (9) Collaborative and Networked Digital Leadership, (10) Agile and Adaptive Digital Leadership, (11) Digital Leadership for Enhancing Customer Experience, (12) Cybersecurity and Privacy Leadership, and (13) Digital Change Management Leadership. Furthermore, the results of the Interpretive Structural Modeling (ISM) indicated that the digital leadership model consists of four hierarchical levels.

At the first level, only Strategic Digital Leadership is present. This component has low influence power but high dependence on other components, reflecting its strategic and long-term significance. Although it cannot independently generate major impacts, it is highly sensitive to changes in other areas. Therefore, it should be regarded as a key factor in strategic decision-making, as it can indirectly exert substantial influence throughout the system.

At the second level, components such as Innovation and Change Leadership, Cultural and Human-Centric Leadership, Data-Driven Leadership, and others are situated. These components serve as supportive and enabling factors within digital transformation processes. Changes in these elements can significantly impact other parts of the system. They require alignment and coordination with other components to ensure effective advancement of digital processes.

At the third level, only Cybersecurity and Privacy Leadership appears. It demonstrates high dependence on other components but also possesses strong influence. This highlights the critical role of data protection and cybersecurity in digital processes, as changes in this domain can exert widespread effects across systems and organizational sectors. Therefore, focused attention to this component is essential to safeguard digital security and privacy.

At the fourth level, components such as Collaborative and Networked Digital Leadership, Agile and Adaptive Digital Leadership, Digital Leadership for Enhancing Customer Experience, and Digital Change Management Leadership are classified as independent and high-impact factors. These components have high influence power and relatively low dependence on others, enabling them to drive rapid and significant organizational changes. As such, they should be prioritized as the core drivers of digital transformation in management strategies.

These findings are consistent with prior studies (Arabiun et al., 2024; Gholichli et al., 2020; Zare & Pashazadeh, 2023). In explaining the results, it can be concluded that in the digital era, managers must be equipped with the capability to formulate and implement digital strategies to help organizations adapt to rapid technological changes. This competency encompasses long-term decision-making focused on digital transformation and aligning business objectives with digital trends. Accordingly, strategic digital leadership involves steering the organization toward digital objectives and ensuring coherence between business strategies and technological advancements.

Banks must guide innovative projects and adopt emerging technologies by embracing digital transformation to improve performance. Managers should foster an environment where employees can actively participate in creative processes, accept change, and engage in experimentation and innovation in both methods and services. This enables the delivery of higher-quality services to customers through the use of modern technologies.

Moreover, digital transformation requires not only technological changes but also cultural and human transformations. This dimension emphasizes managing cultural change, enhancing employees' digital skills, and promoting a culture of flexibility and collaboration in the digital space. Managers must prepare employees to adapt to new digital changes and promote a culture of teamwork and adaptability within the organization.

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Additionally, the ability to leverage data for decision-making and to optimize banking services is vital in the digital world, especially in digital banking. The use of data analytics, artificial intelligence, and advanced analytics allows banks to deliver more precise services and gain competitive advantages.

Limitations of this study include its qualitative methodology, which raises the question of whether similar findings would emerge using other research approaches. Another limitation is the relatively small and context-specific sample, which limits the generalizability of the findings across the entire banking sector in the country.

For future research, it is recommended that scholars examine the impact of Innovation and Change Leadership on the development of digital business models in the financial sector. Furthermore, mixed-methods approaches (qualitative–quantitative) should be employed, and the research population should be expanded to include all public and private banks.

Given the high dependence of Strategic Digital Leadership on other components and its influence on long-term processes, managers should focus on the development and implementation of digital strategies. In this regard, there is a need to form expert teams dedicated to analyzing digital trends and aligning business strategies with technological shifts. Therefore, managers must understand the importance of long-term decision-making and its alignment with digital transformation.

Considering the significant impact of Cybersecurity and Privacy Leadership on other components, managers should prioritize enhancing organizational security practices. This includes investing in advanced technologies for data protection, training staff and users in cybersecurity, and improving internal security protocols. Collaborating with external institutions and security experts can further strengthen the organization's system security.

Ethical Considerations

All procedures performed in this study were under the ethical standards.

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Conflict of Interest

The authors report no conflict of interest.

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