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Qualitative Content Analysis for Extracting a Business Model of Electronic Banking Based on Mutual Collaboration with Financial Startups

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ABSTRACT

The purpose of this research is to present a business model for electronic banking through collaboration with financial startups. The research method is content analysis of previous studies using a thematic analysis approach, along with the analysis of texts obtained from interviews with experts in the banking and startup sectors through a grounded theory method. The research sample was selected purposefully, and 11 individuals were considered based on the criterion of theoretical saturation. Based on the results of content analysis of empirical foundations and the paradigm of open, axial, and selective coding, the key components and relationships among them are articulated in the form of four main propositions. The first proposition refers to causal factors influencing the pattern of the business model, which include organizational culture, information security, technological equipment, technology adoption, competition, systemic coordination, and other factors related to management and leadership. The second proposition addresses the conditions and contextual factors affecting the implementation of strategies, including laws and regulations, specialized human resources, technological infrastructure, and market conditions. These factors provide the foundation for strategies such as employee training and empowerment, data analysis and customer orientation, and the development of a culture of collaboration. The third proposition highlights the internal processes of banks and startups, government policies, and regulatory institutions as general contexts for interactions and actions. Finally, the fourth proposition examines the outcomes of mutual collaboration between electronic banking and financial startups, which include access to new technologies, effective management, increased productivity, development of financial technologies, and improvement of customer experience. These outcomes lead to the creation of a collaborative ecosystem and new market opportunities, ultimately contributing to cost reduction and the development of a shared understanding of goals and needs.

Keywords: electronic banking, financial startups, mutual collaboration, thematic analysis

Introduction

The rapid transformation of the financial sector in recent decades has been largely shaped by the accelerated adoption of financial technologies (FinTech), which has created new opportunities and challenges for banks, startups, regulators, and customers worldwide. Financial digitalization has become a key driver of innovation, efficiency, and competitiveness in both developed and emerging economies, altering traditional business models and pushing institutions toward deeper integration of technology in their operations [1]. Within this context, FinTech firms and banks are increasingly interdependent, with partnerships becoming essential for survival and growth in competitive markets [2]. The dynamic interplay between innovation-driven FinTech startups and stability-oriented traditional banks has generated a fertile area of research for

understanding business models, collaborative mechanisms, and regulatory frameworks that support sustainable digital transformation.

One of the most prominent features of this transformation is the expansion of digital banking, which has emerged as both a response to and a catalyst for FinTech development. Digital banking enables banks to adopt new tools, expand their customer reach, and reduce transaction costs, while FinTech startups offer agility, creativity, and technical expertise to rapidly adapt to market needs [3]. Empirical studies highlight that the integration of FinTech services within banking systems promotes financial inclusion, increases efficiency, and creates new competitive advantages [4]. However, these collaborations are not without challenges, as banks must balance innovation with risk management, compliance, and customer trust [5].

Scholars argue that banks and FinTech startups bring complementary strengths into their partnerships. Banks possess strong infrastructure, financial capital, and regulatory experience, whereas startups provide innovative technologies, customer-centric services, and flexible business models [6]. The integration of these strengths contributes to digital banking transformation, a process that has been documented across multiple regions and industries [7]. In Sub-Saharan Africa, for instance, e-banking has significantly impacted profitability by aligning technological adoption with financial determinants, demonstrating the pivotal role of financial innovation in improving institutional performance. Similarly, in Islamic banking contexts, collaborative models have shown that partnerships with FinTech firms can enhance financing distribution efficiency and improve overall financial outcomes [8].

Research has also emphasized the strategic importance of designing entrepreneurial and technological models that align FinTech innovations with banking practices. Interpretive-structural modeling approaches have been used to build entrepreneurial frameworks for the banking industry, aiming to provide structured pathways for technology integration [9]. Technology transfer frameworks are likewise essential for ensuring that banks can absorb, adopt, and effectively implement advanced solutions, which requires both organizational readiness and supportive policy environments [10]. Such frameworks underscore the importance of aligning innovation with strategic goals, governance structures, and institutional culture.

From a broader perspective, bibliometric and systematic reviews confirm the expanding role of FinTech in reshaping banking and finance globally. A comprehensive mapping of the FinTech landscape highlights key thematic clusters such as digital payments, blockchain, peer-to-peer lending, and robo-advisory, revealing the diversification of applications across the financial ecosystem [4]. Other systematic reviews have specifically examined the impact of FinTech on profitability in the banking sector, showing how the integration of technological innovations not only enhances customer experience but also improves banks' financial performance [11]. In addition, scholars have investigated the connections between financial technologies, consumer behavior, and trust, concluding that FinTech adoption is significantly influenced by literacy, perceived security risks, and optimism toward digital solutions [5].

The Iranian context, similar to other emerging economies, has provided rich insights into the collaborative dynamics of banks and FinTechs. Studies applying factor analysis have examined the elements of electronic banking business models, demonstrating the multidimensional nature of digital transformation [12]. Reviews of collaboration factors have identified key enablers such as regulatory clarity, technological infrastructure, and cultural readiness, which are critical for fostering trust and successful partnerships [13]. Moreover, case studies from local banks emphasize that customer satisfaction in electronic services can be significantly enhanced through FinTech integration, reinforcing the argument that collaboration leads to more efficient and responsive service delivery [14].

International experiences further expand this understanding by highlighting how Islamic banking systems have attempted to reconcile technological entrepreneurship with cultural and religious requirements. Research on internationalization models for technological entrepreneurship has revealed that Islamic banks can achieve broader outreach and competitiveness by leveraging FinTech partnerships, provided that regulatory and ethical frameworks are carefully managed [15]. Such models stress the global applicability of collaborative frameworks while recognizing the contextual differences between banking systems.

Another vital dimension is the role of artificial intelligence (AI), big data, and cloud computing in modernizing financial systems. Studies show that AI-driven FinTech innovations are revolutionizing banking practices by enabling predictive analytics, automated decision-making, and enhanced security systems [16]. Cloud-based zero trust architectures are increasingly adopted to secure FinTech ecosystems, providing end-to-end protection for sensitive data and ensuring compliance with international standards [17]. These technological advancements not only modernize infrastructure but also facilitate partnerships by creating common digital platforms that both banks and startups can utilize.

Scholars also note the importance of fuzzy decision-making tools and advanced analytical models to optimize the implementation of FinTech solutions in banking. Applications of fuzzy DANP (Decision-making and Trial Evaluation Laboratory combined with Analytic Network Process) provide structured methods for prioritizing factors that support FinTech adoption in financial systems [18]. Such analytical frameworks guide decision-makers in identifying the most effective pathways for technological integration, ensuring that collaborations are both strategic and sustainable. Similarly, systematic reviews of FinTech and consumer research emphasize the importance of integrative frameworks that connect technology adoption with consumer trust, risk perception, and long-term value creation [19].

The relationship between FinTech adoption and environmental and social considerations is another emerging strand of research. For example, studies on BRICS economies have demonstrated that FinTech adoption, when aligned with renewable energy use and resource management, can contribute to greener economic recovery and environmental sustainability [20]. This broadens the significance of FinTech from a purely financial perspective to one that incorporates global sustainability goals, highlighting the interdisciplinary potential of technological innovations.

At the same time, concerns around regulatory frameworks, financial literacy, and money laundering risks remain significant. Research indicates that FinTech adoption without sufficient oversight can increase vulnerability to financial crimes, requiring strong regulatory interventions and enhanced literacy initiatives to mitigate risks [21]. Trust, regulation, and consumer perception are thus central to the successful implementation of FinTech solutions, as customer adoption depends not only on technical availability but also on assurance of security and reliability [5].

The increasing complexity of bank–FinTech collaborations calls for holistic models that capture the multifaceted interactions among technological, organizational, and environmental factors. Empirical and theoretical contributions emphasize that future research should pay greater attention to the mediating role of institutional culture, leadership, and regulatory capacity in shaping collaborative outcomes [7, 13]. Moreover, global comparisons demonstrate that while advanced economies benefit from established infrastructures, emerging markets present unique opportunities for leapfrogging traditional models through innovative partnerships [2, 6].

The convergence of these insights underscores that collaboration between banks and FinTechs is no longer optional but essential for building resilient, customer-centered, and technologically advanced financial systems. By systematically

analyzing previous research, identifying key determinants of collaboration, and recognizing the challenges of regulation, risk, and cultural adaptation, scholars and practitioners can develop frameworks that support effective digital transformation [1, 22].

Therefore, the aim of this study is to develop a conceptual business model of electronic banking based on mutual collaboration with financial startups, grounded in both theoretical perspectives and empirical evidence.

Methodology

In this study, a thematic analysis approach and qualitative content analysis of the texts derived from interviews were used to achieve the results. In this regard, after several rounds of reviewing and refining research articles and dissertations, a number of sources were excluded and not considered in the analysis process. The sampling method for the studies in this research is purposive sampling, and two criteria of "inclusion" and "exclusion" were used to select appropriate texts. To determine accuracy, validity, and significance, and also to evaluate and select the reviewed studies more precisely, the inclusion and exclusion criteria were applied. At this stage, after four rounds of screening, from among 79 studies, 64 were eliminated, and 15 studies were selected for data analysis.

Inclusion criteria: In this article, the inclusion criteria refer to the standards on the basis of which the intended research enters the study.

Exclusion criteria: The second filter in selecting appropriate studies is the exclusion criteria.

Table 1.

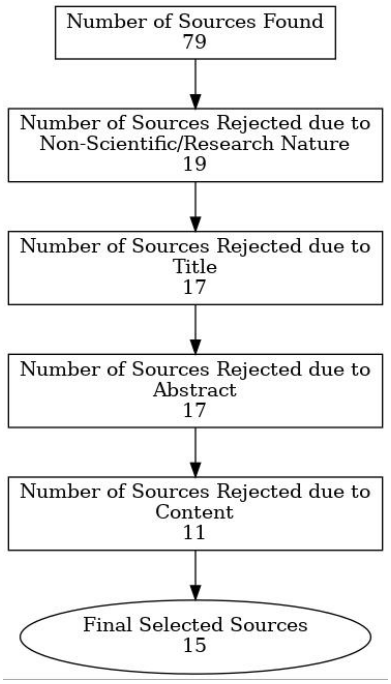
Inclusion and Exclusion Criteria of the Reviewed Studies

Inclusion Criteria	Exclusion Criteria
Published research articles and dissertations available in the Irandoc database in the relevant field	Studies that did not report sufficient information regarding the objectives of this research
Articles and research conducted using quantitative, qualitative, or mixed scientific research methods	Studies conducted with identical titles and objectives
Studies that reported sufficient data and information related to the objectives of the research	Studies lacking an appropriate methodological framework
Studies that underwent expert peer review and were published as full papers either online or in print	Studies lacking the necessary scientific quality due to publication in low-quality journals
Published articles and research in the relevant field between 2016 and 2023	Review and library-based studies
Articles and research that examined the intended subject using scientific methods	Studies conducted before 2016 (Gregorian calendar) and 1393 (Hijri-Shamsi calendar)

The process of screening and reviewing according to the inclusion and exclusion criteria is briefly illustrated in Figure 1.

Figure 1.

Stages of Selecting the Checklist of Reviewed Studies from the Selected Database



Considering the above, in Table 2 the main and subcategories extracted from the empirical background of the research are presented.

Findings and Results

In this section, the content of previous studies in the research domain has been analyzed:

Table 2.

Main and Subcategories of the Model of Mutual Collaboration Between Electronic Banking and Financial Startups in Previous Studies

No.	Source	Proposed Components
1	[8]	Non-performing loans, return on assets, dividend return
2	[9]	Trusted advisor, desirable bank, provision of specialized services and products, digitalization, ecosystem
3	[6]	Profit-sharing, lending balance sheet assets, asset and wealth management, payments, transfers, forex, cryptocurrencies
4	[2]	Increased profitability of fintech by banks, new products and services by fintech
	[22]	Website design, website quality and environment, outcomes of a desirable website
5	[1]	Environmental changes, life cycle, social changes, stakeholders, economic value, environmental value, social value, communication, partners, activities, value, customer relations, distribution channels, customer segmentation, resources, revenue, cost, functional values, materials, production, suppliers, outsourcing, profit and environmental effects, consumption stage, product end-of-life, employees, governments, social culture, social profit, social impacts
6	[4]	Firm-centric business model, network business model, interaction, communication, information technology, existing partners, new partners, new methods
7	[15]	Market, technology, change, infrastructure components, linear or simple product innovation, design, creating a value network for customers, lower risk for partners, resources, suppliers, competitive advantage, improved product and service, patience in times of uncertainty, limitations of business model development
8	[22]	Website design, website quality and environment, outcomes of a desirable website
9	[9]	Innovative capabilities, entrepreneurial orientation, supply chain initiatives, market structure of the banking industry, technological activities
10	[10]	Identification of technological needs, updating, research and development, negotiation, knowledge transfer, acquisition of operational knowledge, implementation of technical knowledge, presenting a transfer plan and providing infrastructure
11	[12]	Cultural contexts, how banks interact with other industry actors, and how the regulator interacts with banks
12	[3]	Digital design, quality of customer relationships, and customer commitment
13	[13]	Structure of financial institutions, customer segmentation, financial technology developers, and business environment
14	[14]	Product/service, target customers, distribution channel, customer loyalty, insurance, resources and competencies, collaboration networks or partners, cost structure, revenue structure, and electronic intermediaries
15	[7]	Weaknesses of traditional banking models, familiarity with modern technologies, adoption of electronic banking, model selection, virtual banking, online self-service, and improvement of future performance

The classification of main and subcategories is presented as follows:

Table 3.

Classification of Subcategories and Main Categories and Their Related Sources

Main Category	Subcategory	Sources
Advantages for Financial Startups	Provision of specialized services and products	[9]; [6]; [1]
	Lending balance sheet assets	[1]
	Transfers	[6]; [10]
	Communications and partners	[1]; [3]; [13]
	Resources and revenue	[1]; [15]; [10]; [14]
	Outsourcing	[1]
	Supply chain initiatives	[9]
	Research and development	[10]
Advantages for Banks	Desirable bank	[9]
	Provision of specialized services and products	[9]; [22]
	Digitalization and innovative capabilities	[9]; [22]; [4]; [15]; [9]; [10]; [3]; [7]
	Asset and wealth management	[6]
	Transfers	[6]; [10]
	New product and service offerings	[2]; [15]; [22]; [14]
	Values	[1]
	Communications and partners	[1]; [4]; [10]; [12]; [13]; [14]
	Customer segmentation	[1]
	Business models	[4]; [15]; [7]; [7]
Connecting Components	Non-performing loans	[8]
	Return on assets	[8]; [6]; [1]
	Dividend return	[8]; [6]; [2]; [1]
	Trusted advisor	[9]; [10]
	Ecosystem	[9]; [22]; [1]; [12]; [13]
	Payments	[6]
	Forex and cryptocurrencies	[6]
	Distribution channels	[1]; [3]; [14]

To extract the model from the themes derived from both domestic and international studies, several stages were undertaken. First, the themes were collected and classified based on the main and subcategories, and their accuracy and significance were evaluated. Then, the related themes were analyzed, and the patterns and relationships among them were identified. Subsequently, the main and subcategories were determined, and the model structure was specified. The barriers and adverse impacts of the model were examined and improved based on recent studies. Finally, the final model was developed, and the relationships among the categories were precisely mapped. The initial conceptual model was then illustrated in the form of a diagram to facilitate the transfer of ideas and relationships. This process demonstrates a procedural perspective in the themes and emphasizes their conceptual sequence within the model.

Table 4.

Main and Subcategories Forming the Initial Conceptual Model

Overarching Theme	Frequency	Some Related Themes
Advantages for Financial Startups	16	Provision of specialized services and products; Lending balance sheet assets; Transfers; Communications and partners; Resources and revenue; Outsourcing; Supply chain initiatives; Research and development
Advantages for Banks	31	Desirable bank; Provision of specialized services and products; Digitalization and innovative capabilities; Asset and wealth management; Transfers; New product and service offerings; Values; Communications and partners; Customer segmentation; Business models
Connecting Components	20	Non-performing loans; Return on assets; Dividend return; Trusted advisor; Ecosystem; Payments; Forex and cryptocurrencies; Distribution channels

At this stage, the text of each interview was read, and for each key point, a code was assigned. Before presenting the results of the coding stages in grounded theory, the demographic characteristics of the expert group of the research are described.

The age distribution of the expert sample is as follows:

Table 5.

Age of Experts

Age	Frequency	Percentage
35–45 years	4	36
46–55 years	5	45
56 and above	2	19
Total	11	100

The work experience of the expert sample is as follows:

Table 6.

Work Experience of Experts

Work Experience	Frequency	Percentage
5–10 years	5	45
10–20 years	4	36
21 years and above	2	19
Total	11	100

The educational background of the expert sample is as follows:

Table 7.

Education of Experts

Education Level	Frequency	Percentage
Bachelor's	1	10
Master's	5	45
PhD and above	5	45
Total	11	100

In coding the interview texts, various steps were undertaken to extract key concepts and patterns. First, the interview text was carefully studied, and key concepts were identified. Then, using MAXQDA software, a coding system was developed, and coding units were defined and assigned a code name or number. The main components of the text were selected, and the text was coded based on them. After coding, the codes were analyzed, and patterns were identified. Finally, the results of coding were reported, and the conducted analyses were explained. Coding through grounded theory helps researchers derive theories from empirical data and is particularly useful in social sciences and human studies.

At this stage, the researcher collects information through interviews, observations, texts, and any type of related data. The data must be in-depth and rich, allowing the researcher to gain a deeper understanding of the subject. In open coding, the researcher identifies and labels the concepts and characteristics of the data. This stage involves breaking down the data into smaller parts and identifying key patterns and concepts. The researcher must assign a code to each concept that represents its characteristics. In this study, a total of eleven interviews were conducted. The adequacy criterion for the number of interviewees was theoretical saturation. From the tenth participant onwards, no new concepts emerged; however, to ensure greater certainty, one additional interview was conducted. Based on this, the number of concepts contained in the interviews is presented in the table below.

Table 8.

Codes Identified Based on Interviews

Document name	Coded Segments
Eleventh interview	28
First interview	17
Fifth interview	33
Fourth interview	30
Tenth interview	25
Second interview	35
Third interview	8
Sixth interview	17
Ninth interview	43
Eighth interview	14
Seventh interview	16

Considering the interviews conducted and the issues raised, the following concepts for the electronic banking business model for mutual collaboration with financial startups were identified. These concepts, based on the interviews, are presented in Table 9.

Table 9.

Concepts and Codes Identified in Interviews with the Expert Group

	Eleventh interview	First interview	Fifth interview	Eighth interview	Seventh interview	Third interview	Ninth interview	Sixth interview	Fourth interview	Second interview	Tenth interview	Total
Mutual collaboration between bank–financial startup	0	1	0	0	0	0	0	0	0	0	0	1
Outcomes	0	1	0	0	0	0	0	0	0	0	0	1
System transparency	0	0	0	0	0	0	1	0	0	0	0	1
Effective management	0	0	0	0	0	0	1	0	0	0	0	1
Increased productivity	0	0	0	0	0	0	1	0	0	0	0	1
Establishing a collaborative ecosystem	0	0	0	0	0	1	0	0	0	0	0	1
Improved services and security	0	0	0	0	0	1	0	0	0	1	0	2
Access to new technologies	0	0	0	0	0	1	1	0	0	1	0	3
New market opportunities	0	0	0	0	0	0	0	0	0	0	1	1
Increased credibility	0	0	0	0	0	0	0	0	0	0	1	1
Access to financial and technological resources	0	0	0	0	0	0	1	0	0	0	1	2
Cost reduction	0	0	0	0	0	0	0	0	0	0	1	1
Improved customer experience	0	0	0	0	0	0	0	0	0	0	1	1
Development of financial technologies	0	0	1	0	0	0	0	0	0	0	0	1
Service diversification	0	0	1	0	0	0	0	0	0	0	0	1
Agility	0	0	1	0	0	0	0	0	0	0	0	1
Expansion of research and development fields	0	1	0	0	0	0	1	0	0	0	0	2

Joint investment	0	1	0	0	0	0	1	0	0	0	0	2
Newer and faster services	0	1	0	0	0	0	0	0	0	0	1	2
Increased creativity and innovation	0	1	0	0	0	0	1	0	0	0	1	3
Creating a shared understanding of goals and needs	0	1	0	0	0	0	0	0	0	0	0	1
Strategies	0	1	0	0	0	0	0	0	0	0	1	2
Attention to regulations and security	1	0	0	0	0	0	0	0	0	0	0	1
Data analysis and customer orientation	1	0	0	0	0	0	0	0	0	0	0	1
Development of a culture of collaboration	1	0	0	0	0	0	0	0	0	0	0	1
Expansion of research and development	1	0	0	0	0	0	0	0	0	0	0	1
Investment in new technologies	1	0	0	0	0	0	0	0	0	0	0	1
Use of new business models	1	0	0	0	0	0	0	0	0	0	0	1
Establishment of financial accelerators	1	0	0	0	0	0	0	0	0	0	0	1
Development of technological collaborations	1	0	0	0	0	0	0	0	0	0	0	1
Focus on employee training and empowerment	0	0	0	1	0	0	0	0	0	1	1	3
Joint investment	0	0	0	0	0	0	0	0	0	0	1	1
Establishing regular and transparent communications	0	0	0	0	0	0	0	0	0	0	1	1
Creation of joint innovation programs	1	0	0	0	0	0	0	0	0	0	1	2
Conducting workshops and training events	1	1	0	0	0	0	0	0	0	0	0	2
Intervening factors	0	1	0	0	1	0	0	0	0	0	0	2
Government policies	0	0	0	0	1	0	0	0	0	1	0	2
Internal processes of banks and startups	0	0	0	1	1	0	0	0	0	0	1	3
Competitors	0	0	0	0	0	0	0	0	0	0	1	1
Regulatory bodies	0	0	0	0	1	0	0	0	0	0	1	2
Contextual factors	0	1	0	0	0	0	0	0	1	0	0	2
Organizational transformation and changes	0	0	0	0	0	0	0	1	0	0	0	1
Proper understanding of the cultural context	0	0	0	0	0	0	0	0	0	0	1	1
Proper understanding of the economic context	0	0	0	0	0	0	0	0	0	1	1	2

Proper understanding of the social context	0	0	0	0	0	0	0	0	0	0	1	1
Existence of big data and cloud technologies	0	0	0	0	0	0	0	0	0	0	1	1
Technological infrastructure	0	0	0	0	0	0	0	0	0	0	1	1
Market conditions and competition	0	0	0	0	0	0	0	0	0	0	1	1
Specialized human resources	0	0	0	0	0	0	0	0	1	0	0	1
Laws and regulations	0	1	0	0	0	1	0	1	0	1	0	4
Causal factors	0	1	0	0	0	0	0	0	0	0	0	1
Customer-related factors	0	0	0	0	0	0	0	0	0	1	0	1
Leadership and strategy	0	0	0	0	0	0	0	0	0	1	0	1
Increasing the necessary knowledge and skills for collaboration	0	0	0	0	0	0	0	0	0	1	0	1
Innovation culture	0	0	0	0	0	0	0	0	0	1	0	1
IT infrastructure	0	0	0	0	0	0	0	0	0	1	0	1
Application of digital leadership	0	0	0	0	0	0	0	0	1	0	0	1
Structuring	0	0	0	0	0	0	0	0	1	0	0	1
Recognition of models and structures based on business digitalization	0	0	0	0	0	0	0	0	1	0	0	1
Technology adoption	0	0	0	0	0	0	0	0	1	0	0	1
Technological equipping	0	0	0	0	0	0	0	0	1	1	0	2
Security management	0	0	1	0	0	0	0	0	0	0	0	1
Transparency of the banking system	0	0	1	0	0	0	0	0	0	0	0	1
Technological governance	0	0	1	0	0	0	0	0	0	0	0	1
Systemic coordination	0	0	1	0	0	0	0	0	0	0	0	1
Competition	0	1	0	0	0	0	0	0	0	1	0	2
Information security	0	1	0	1	0	0	0	0	0	0	0	2
Organizational culture	0	1	1	0	0	0	0	1	0	1	1	5
Technology	0	1	1	0	0	0	0	0	0	0	0	2

In continuation of the first step, by juxtaposing the corresponding initial codes extracted from the 11 interviews, the main concepts were identified, which are in fact combinations of several initial codes. Based on the interviews conducted with experts, a total of 6 main components, 63 subcomponents, and 266 concepts were ultimately identified, which are presented in various forms below.

The following table shows the corresponding concepts in the interviews and their number of repetitions and frequencies:

Table 10.

Corresponding Concepts Extracted in the Research

Concepts	Frequency	Percentage Frequency
Organizational culture	5	45.45
Laws and regulations	4	36.36
Focus on employee training and empowerment	3	27.27
Internal processes of banks and startups	3	27.27
Access to new technologies	3	27.27
Increased creativity and innovation	3	27.27
Improved services and security	2	18.18
Strategies	2	18.18
Access to financial and technological resources	2	18.18
Creation of joint innovation programs	2	18.18
Conducting workshops and training events	2	18.18
Intervening factors	2	18.18
Government policies	2	18.18
Expansion of research and development fields	2	18.18
Regulatory bodies	2	18.18
Contextual factors	2	18.18
Proper understanding of the economic context	2	18.18
Joint investment	2	18.18
Technological equipping	2	18.18
Competition	2	18.18
Information security	2	18.18
Newer and faster services	2	18.18
Technology	2	18.18
Data analysis and customer orientation	1	9.09
Development of a culture of collaboration	1	9.09
Expansion of research and development	1	9.09
Investment in new technologies	1	9.09
Use of new business models	1	9.09
Establishment of financial accelerators	1	9.09
Development of technological collaborations	1	9.09
New market opportunities	1	9.09
Joint investment	1	9.09
Establishing regular and transparent communications	1	9.09
Increased credibility	1	9.09
System transparency	1	9.09
Cost reduction	1	9.09
Improved customer experience	1	9.09
Development of financial technologies	1	9.09
Competitors	1	9.09
Service diversification	1	9.09
Agility	1	9.09
Organizational transformation and changes	1	9.09
Proper understanding of the cultural context	1	9.09
Effective management	1	9.09
Proper understanding of the social context	1	9.09
Existence of big data and cloud technologies	1	9.09
Technological infrastructure	1	9.09
Market conditions and competition	1	9.09
Specialized human resources	1	9.09
Increased productivity	1	9.09
Causal factors	1	9.09
Customer-related factors	1	9.09
Leadership and strategy	1	9.09
Increasing the necessary knowledge and skills for collaboration	1	9.09
Innovation culture	1	9.09
IT infrastructure	1	9.09
Application of digital leadership	1	9.09
Structuring	1	9.09
Recognition of models and structures based on business digitalization	1	9.09
Technology adoption	1	9.09

Establishing a collaborative ecosystem	1	9.09
Security management	1	9.09
Transparency of the banking system	1	9.09
Technological governance	1	9.09
Systemic coordination	1	9.09
Mutual collaboration between bank–financial startup	1	9.09
Creating a shared understanding of goals and needs	1	9.09
Outcomes	1	9.09
Attention to regulations and security	1	9.09
DOCUMENTS with code(s)	11	100
DOCUMENTS without code(s)	0	0
ANALYZED DOCUMENTS	11	100

Once the data were opened and concepts emerged from within them, the researcher sought instances that could help group the concepts into categories. According to Strauss and Corbin (1998), some concepts can be categorized under a category that has a higher level of abstraction than those concepts (Strauss & Corbin, 1998). Categories help describe what is taking place; therefore, in continuation of the first step, by aligning the corresponding concepts, the categories were identified, which are in fact combinations of several concepts.

Axial coding is the process of relating categories to subcategories and linking categories at the level of properties and dimensions. This coding is called “axial” because coding is realized around the axis of a category. At this stage, the categories—properties and dimensions resulting from open coding—are articulated and positioned so that knowledge of the processes concerning relationships is formed (Lee, 2001). Strauss discussed several main actions in the axial coding stage, which are shown in the list below (Strauss, 1987).

- Stating the properties of a category and its dimensions—an action that began during open coding.
- Identifying the various conditions of action or interactions, and the various consequences related to a phenomenon.
- Relating a category to its subcategories through propositions that explain how they are connected to each other.
- Searching the data for clues that indicate how the main categories might be related.

At this stage, the researcher selects one category from the open coding stage and places it at the center of the process under investigation as the “core category,” and then relates the other categories to it. These other categories include “causal conditions,” “contextual and intervening conditions,” and “consequences.” This stage involves drawing a diagram called the “coding paradigm.” The coding paradigm displays the interrelationships among conditions, causal strategies, contextual and intervening conditions, and consequences.

The core category is the central idea, phenomenon, event, or incident toward which the flow of actions and reactions are directed in order to manage, control, or respond to it. The core category is associated with the main question: *What do the data indicate?* The core category is the central idea, image, or phenomenon that forms the foundation and axis of the process. This category is the title, name, or conceptual label assigned to the framework or scheme that has been developed. The core category in this study has been identified in Tables 11 and 12.

Table 11.

Concepts Identified in the Research

Concepts	Subcategory	Main Category
Integration of the technical innovations of startups with the strong infrastructure of banks in order to provide better and more efficient financial services to customers	Mutual collaboration of banks with financial startups	Core category
Integration of modern technologies with banking infrastructure to create innovative financial services and improve customer experience		

Table 12.

Main Categories Related to the Core Category

	Documents	Percentage	Percentage (valid)
Causal conditions	7	63.64	63.64
Contextual conditions	6	54.55	54.55
Consequences	6	54.55	54.55
Strategies	5	45.45	45.45
Intervening conditions	5	45.45	45.45
DOCUMENTS with code(s)	11	100	100
DOCUMENTS without code(s)	0	0	–
ANALYZED DOCUMENTS	11	100	–

Causal conditions are the events and occurrences that lead to the emergence or expansion of the phenomenon under study.

Table 13.

Causal Conditions of the Research

Causal Conditions	Segments	Percentage
Organizational culture	11	13.41
Information security	7	8.54
Technological equipping	7	8.54
Technology adoption	6	7.32
Competition	6	7.32
Systemic coordination	5	6.10
Structuring	5	6.10
Security management	4	4.88
Transparency of the banking system	4	4.88
Technological governance	4	4.88
Leadership and strategy	4	4.88
Recognition of models and structures based on business digitalization	4	4.88
IT infrastructure	4	4.88
Application of digital leadership	4	4.88
Customer-related factors	3	3.66
Technology	2	2.44
Increasing the necessary knowledge and skills for collaboration	1	1.22
Innovation culture	1	1.22
Total	82	100

Source: Research findings

Contextual conditions are the special circumstances that influence strategies. They indicate the specific set of conditions within which strategies of action and reaction take place.

Table 14.

Contextual Conditions of the Research

Contextual Conditions	Segments	Percentage
Laws and regulations	9	31.03
Organizational transformation and changes	7	24.14
Specialized human resources	4	13.79
Proper understanding of the economic context	4	13.79
Existence of big data and cloud technologies	1	3.45
Technological infrastructure	1	3.45
Market conditions and competition	1	3.45
Proper understanding of the cultural context	1	3.45
Proper understanding of the social context	1	3.45
Total	29	100

Intervening conditions are structural circumstances that belong to the phenomenon under study and influence strategies of action and reaction. They constrain or facilitate strategies within a particular context.

Table 15.

Intervening Conditions of the Research

Intervening Conditions	Segments	Percentage
Internal processes of banks and startups	10	38.46
Government policies	9	34.62
Regulatory bodies	6	23.08
Competitors	1	3.85
Total	26	100

Strategies are specific actions or interactions that result from the main phenomenon. Strategies are based on actions and reactions aimed at controlling, managing, and addressing the phenomenon under study. Strategies are intentional, purposeful, and carried out for a reason. At the same time, they may also serve goals unrelated to the phenomenon, but nonetheless they yield consequences for it.

Table 16.

Strategies of the Research

Strategies	Segments	Percentage
Focus on employee training and empowerment	7	17.95
Data analysis and customer orientation	6	15.38
Attention to regulations and security	5	12.82
Use of new business models	4	10.26
Development of a culture of collaboration	4	10.26
Expansion of research and development	2	5.13
Establishment of financial accelerators	2	5.13
Investment in new technologies	2	5.13
Creation of joint innovation programs	2	5.13
Conducting workshops and training events	2	5.13
Establishing regular and transparent communications	1	2.56
Development of technological collaborations	1	2.56
Joint investment	1	2.56
Total	39	100

Consequences are the outcomes that emerge as a result of strategies. Consequences are the products of actions and reactions. They cannot always be predicted and are not necessarily those intended by individuals. Consequences may take the form of events, may be negative, real or implicit, and may occur in the present or in the future. Moreover, what is considered a consequence at one point in time may later transform into part of the conditions or factors.

Table 17.

Consequences of the Research

Categories	Segments	Percentage
Access to new technologies	16	19.75
Effective management	9	11.11
Access to financial and technological resources	8	9.88
Expansion of research and development fields	7	8.64
Increased productivity	6	7.41
Development of financial technologies	5	6.17
Increased creativity and innovation	5	6.17
Agility	4	4.94
System transparency	4	4.94
Service diversification	4	4.94
Improved services and security	2	2.47

Joint investment	2	2.47
Newer and faster services	2	2.47
Establishing a collaborative ecosystem	2	2.47
Improved customer experience	1	1.23
Increased credibility	1	1.23
New market opportunities	1	1.23
Cost reduction	1	1.23
Creating a shared understanding of goals and needs	1	1.23
Total	81	100

In open and axial coding, the business model of electronic banking for collaboration with financial startups was developed, which included antecedent conditions, contextual conditions, intervening conditions, policy implementation, strategies, and policy evaluation. Selective coding, using the results of previous stages, selects the core category and connects it to the other categories. This process includes defining the storyline, linking subcategories to the core category through the paradigm, validating relationships, and filling in the gaps between categories. These steps are conducted iteratively and ultimately lead to the formulation of the electronic banking business model. To increase the validity of the model, it was presented to experts who provided feedback, and the necessary modifications were made based on their input.

Therefore, based on the narrative description of the components obtained through the paradigm of axial and selective coding, the relationships among them can be expressed in the following propositions. It should be noted that all the variables included in the model were derived from the opinions of the research experts, and the model has been developed in a neutral and unbiased manner.

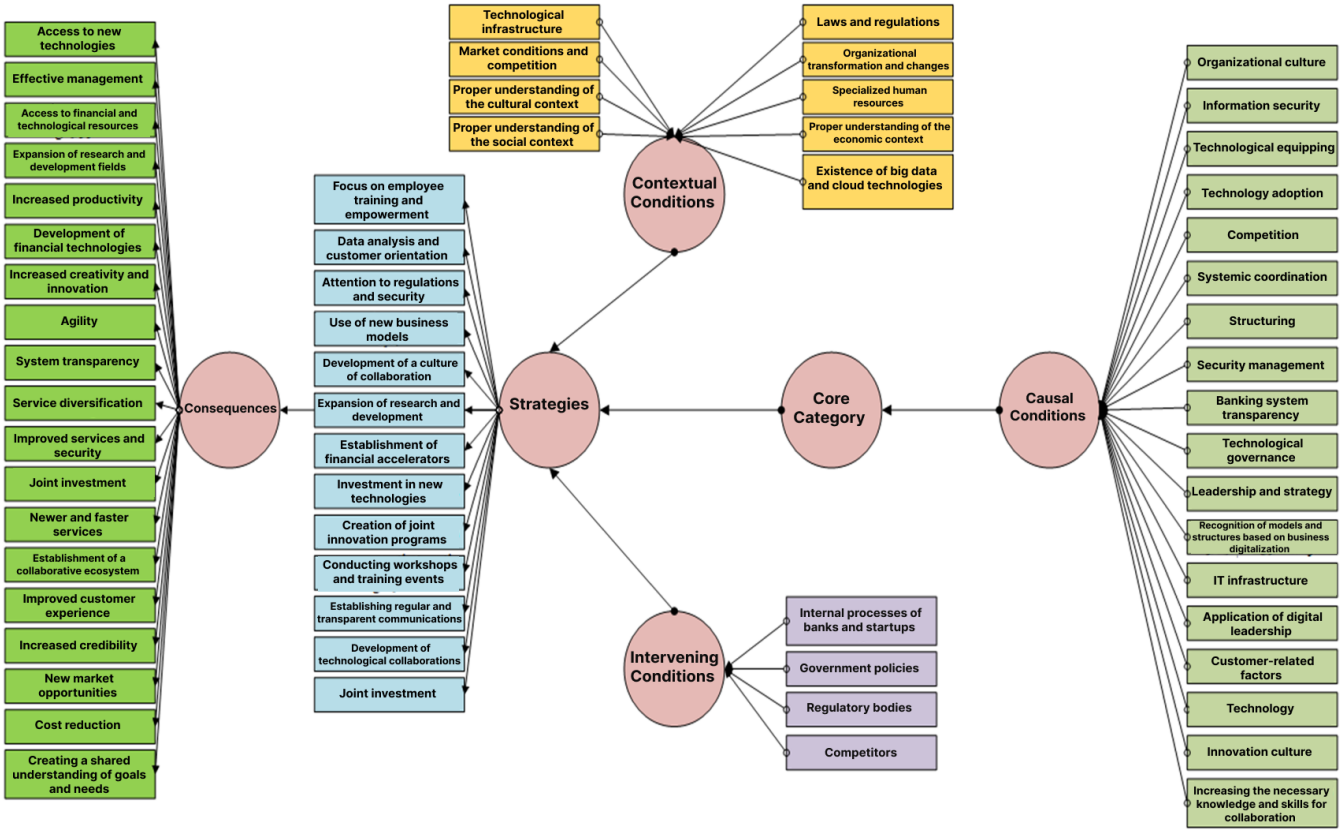
1. Among the causal factors influencing the pattern of the electronic banking business model for mutual collaboration with financial startups are organizational culture, information security, technological equipping, technology adoption, competition, systemic coordination, structuring, security management, banking system transparency, technological governance, leadership and strategy, recognition of models and structures based on business digitalization, IT infrastructure, application of digital leadership, customer-related factors, technology, increasing the necessary knowledge and skills for collaboration, and innovation culture.
2. In addition, laws and regulations, organizational transformation and changes, specialized human resources, proper understanding of the economic context, the existence of big data and cloud technologies, technological infrastructure, market conditions and competition, proper understanding of the cultural context, and proper understanding of the social context constitute the specific context for implementing strategies. These strategies include focusing on employee training and empowerment, data analysis and customer orientation, attention to regulations and security, use of new business models, development of a culture of collaboration, expansion of research and development, establishment of financial accelerators, investment in new technologies, creation of joint innovation programs, conducting workshops and training events, establishing regular and transparent communications, development of technological collaborations, and joint investment.
3. Internal processes of banks and startups, government policies, regulatory bodies, and competitors can also be identified as a general framework for the execution of actions and interactions.
4. Finally, mutual collaboration between electronic banking and financial startups, under the influence of causal conditions, contextual conditions, intervening conditions, and actions and interactions, results in consequences such as access to new technologies, effective management, access to financial and technological resources, expansion of

research and development fields, increased productivity, development of financial technologies, increased creativity and innovation, agility, system transparency, service diversification, improved services and security, joint investment, newer and faster services, establishment of a collaborative ecosystem, improved customer experience, increased credibility, new market opportunities, cost reduction, and the creation of a shared understanding of goals and needs.

Considering the dimensions and the main and subcomponents identified in the model, the theoretical model of the research can be presented as follows:

Figure 2.

Conceptual Model of the Research



Discussion and Conclusion

The findings of this study provide new insights into how electronic banking can be developed through mutual collaboration with financial startups, particularly within contexts where both technological innovation and regulatory constraints play crucial roles. The results indicate that causal conditions such as organizational culture, information security, technological equipping, adoption of technology, competition, systemic coordination, and digital leadership form the foundation of collaborative banking models. These results confirm that institutional readiness and cultural adaptability are prerequisites for the effective integration of FinTech innovations into traditional banking structures [13]. Similar findings have been documented in the Iranian banking system, where factor analysis approaches demonstrated the strong interconnection between culture, governance, and business model design [12]. By identifying the interplay of these determinants, this study

extends earlier work on the collaborative economy in finance [1] and supports the argument that digital transformation must be embedded in both strategic leadership and organizational processes.

The results further highlight that contextual conditions—including regulations, organizational transformation, specialized human resources, and economic and cultural understanding—are essential to guide the implementation of strategies such as employee empowerment, data-driven decision-making, and the adoption of innovative business models. This aligns with systematic reviews that emphasize regulatory frameworks and technological infrastructures as pivotal enablers of bank–FinTech collaboration [4, 11]. The contextual dimension is particularly evident in studies of emerging economies, where regulatory clarity and supportive governance structures have been shown to enhance the success of bank–FinTech partnerships [2]. These findings resonate with evidence from Islamic banking systems, where specialized resources and contextual adaptation are crucial for reconciling technological innovation with cultural and religious principles [8, 15].

Intervening conditions identified in this study—internal processes of banks and startups, government policies, regulatory institutions, and competitor dynamics—reflect the structural complexities that can either facilitate or constrain collaborative outcomes. Previous research confirms that government policies and institutional oversight play a decisive role in determining the scope and sustainability of digital banking innovations [10]. Comparative studies on Sub-Saharan Africa similarly revealed that financial determinants, regulatory guidance, and technological readiness significantly shape the profitability impact of e-banking [7]. Moreover, in Ukraine, cooperation with FinTech startups has been linked to the acceleration of digital banking transformation, but this was contingent upon both institutional processes and competitive pressures [6]. The present findings therefore contribute to the ongoing discourse by integrating these factors into a coherent model that explains how structural environments mediate collaborative banking innovations.

The strategies identified—training and empowerment, regulation compliance, adoption of new business models, technological collaboration, and R&D expansion—emphasize that collaboration is not merely about technological alignment but also about organizational learning and capacity building. The role of human capital, in particular, was reinforced in this study, echoing prior findings that emphasized the importance of knowledge transfer frameworks in ensuring effective technology implementation [9, 10]. Research applying fuzzy DANP approaches has further demonstrated that strategic prioritization of such strategies can enhance FinTech implementation by clarifying which factors carry the most weight in practical execution [18]. These findings collectively point to the need for holistic strategies that combine technology adoption with training, governance, and systemic reforms.

Consequences observed in the study—such as access to new technologies, improved management, increased productivity, greater customer experience, and the creation of collaborative ecosystems—highlight the long-term benefits of mutual partnerships. These results align strongly with studies indicating that FinTech collaborations contribute to customer-centered innovation, diversified financial services, and increased efficiency [3, 19]. Evidence from BRICS economies similarly shows that FinTech adoption, when properly integrated, can not only enhance financial performance but also contribute to sustainability objectives through renewable energy and resource efficiency [20]. Moreover, reviews of consumer trust and FinTech adoption emphasize that these positive outcomes are only realized when customer concerns about security, value, and literacy are addressed [5]. The results of the present study therefore reinforce the dual role of collaboration: improving financial performance while simultaneously enhancing customer confidence and long-term sustainability.

Another significant contribution of this study is the emphasis on risk management, regulatory alignment, and trust-building. The findings highlight that attention to regulations and information security was a recurrent theme, underscoring that without these safeguards, collaborative banking models face heightened risks of failure. Previous research confirms that weak regulatory systems can exacerbate vulnerabilities to financial crimes such as money laundering, making financial literacy and regulatory enforcement essential [21]. Similarly, trust-related studies show that FinTech adoption depends heavily on consumer perception of safety and reliability, which requires not only technical solutions but also transparent communication and strong institutional backing [5]. The identification of trust and security as central to collaborative ecosystems mirrors global literature and highlights their relevance for both emerging and advanced economies [16, 22].

The integration of AI, cloud solutions, and digital leadership as causal and strategic factors in this study points to the increasing role of advanced technologies in shaping collaborative models. Evidence from zero trust cloud architecture research confirms that robust infrastructure design is critical for securing FinTech ecosystems [17]. Similarly, studies on AI-driven modernization highlight that digital leadership and governance must evolve alongside technological capabilities to ensure resilience and sustainability [16]. These findings align with the results of the present study, which emphasize that digital transformation requires not only tools but also leadership models capable of managing change in complex ecosystems.

The cross-validation of results with multiple international contexts underscores the generalizability of the model developed here. In Islamic banking, collaboration with FinTechs has enhanced financing distribution [8]; in Sub-Saharan Africa, e-banking has improved profitability when aligned with determinants of financial stability [7]; in Ukraine, partnerships have accelerated digital banking transformation [6]; and in BRICS economies, FinTech integration has supported sustainability [20]. By synthesizing these diverse findings, the present study demonstrates that although contextual variations exist, the fundamental mechanisms of collaboration—cultural alignment, regulatory support, strategic innovation, and technological integration—are universal.

Taken together, the results of this study extend the theoretical and empirical foundations of bank–FinTech collaboration by providing a structured model that incorporates causal, contextual, and intervening factors alongside strategies and consequences. They support prior bibliometric and systematic reviews that have mapped the FinTech landscape [4, 11], while also offering new insights by integrating findings from both emerging and advanced economies. The model presented here highlights the reciprocal benefits of collaboration, demonstrating that when properly structured, such partnerships can enhance profitability, customer trust, and long-term sustainability.

Despite its contributions, this study is subject to several limitations. First, the data were derived from qualitative interviews and document analysis, which may limit the generalizability of the findings to broader populations or contexts. Second, the reliance on expert opinion, while valuable for depth, introduces potential bias, as interpretations may reflect the subjective perspectives of respondents. Third, the study primarily focused on the banking–FinTech ecosystem within a specific regional context, which may not fully capture the diversity of experiences across global markets. Fourth, the rapidly evolving nature of FinTech means that models developed today may need continuous updates as technologies, regulations, and consumer behaviors change. Finally, while the study incorporated multiple perspectives, quantitative validation of the model through empirical testing remains necessary to ensure robustness.

Future research could address these limitations by employing mixed-methods approaches that combine qualitative insights with quantitative validation, such as structural equation modeling or large-scale surveys. Comparative studies across

different economies—particularly between advanced and emerging markets—could provide deeper insights into how contextual differences shape collaborative outcomes. Longitudinal research would be valuable to track how collaborative models evolve over time in response to technological advances and regulatory changes. Future studies could also explore the role of consumer behavior, financial literacy, and trust-building in more detail, particularly as these factors have been shown to critically influence FinTech adoption. Additionally, research into the environmental and social dimensions of FinTech integration, such as its impact on sustainability and green finance, would contribute to a more holistic understanding of its long-term implications.

Practically, the results suggest that banks should actively pursue partnerships with FinTech startups by creating supportive organizational cultures, investing in technological infrastructure, and prioritizing employee empowerment. Regulators should design flexible yet robust frameworks that enable innovation while safeguarding against risks such as money laundering and cyber threats. Policymakers should promote collaborative ecosystems through incentives and shared platforms that encourage joint innovation. Finally, managers should focus on building trust through transparent communication, strong governance, and consumer-centered strategies, thereby ensuring that collaboration not only enhances financial performance but also contributes to long-term resilience and customer satisfaction.

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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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