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Designing a Data-Driven Metaverse Marketing Framework in Maskan Bank

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ABSTRACT

The present study aimed to design a metaverse marketing model in Maskan Bank based on a data-driven approach, with a focus on digital transformation in the Iranian banking sector. This research employed the grounded theory methodology of Anselm Strauss and Juliet Corbin (1998) and analyzed in-depth interviews with domain experts. The findings led to the identification of five main categories, 26 subcategories, and 65 conceptual codes influencing the metaverse marketing model. The results indicated that competitive pressures, regulatory requirements, shifts in customer preferences, technological infrastructure, human capital, and research and development capacity collectively provide the necessary foundation for data-driven marketing. The final model highlights the central role of data-driven marketing in the development of innovative products, customer experience management, and the dynamic alignment between digital strategy and organizational performance, and is proposed as a practical roadmap for enhancing competitiveness and creating sustainable advantage in Maskan Bank.

Keywords: Metaverse Marketing, Digital Banking, Digital Transformation, Customer Experience Management, Digital Ecosystem, Technological Innovation

Introduction

The rapid evolution of digital technologies has fundamentally altered the architecture of contemporary markets and has compelled organizations to reconsider how value is created, communicated, and delivered. Within this broader transformation, the metaverse has emerged as one of the most discussed and potentially disruptive environments for future marketing, digital interaction, and customer engagement. Rather than being understood merely as a virtual extension of current online platforms, the metaverse represents an interconnected, immersive, data-rich, and persistent digital ecosystem in which individuals, brands, institutions, and intelligent systems interact in real time. Recent scholarship has increasingly framed the metaverse as a new marketing universe that integrates virtual presence, intelligent personalization, multisensory interaction, data analytics, and platform-based value creation into a single strategic domain (1, 2). This transformation is especially important for service industries whose core competitive advantage depends on trust, customer experience, brand meaning, and interactive value delivery. In such sectors, the metaverse is not simply a technological novelty; it is a strategic field that may reshape business models, communication logics, and patterns of customer participation (3, 4).

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Banking is among the sectors most exposed to these pressures because it combines intangible services, sensitive information flows, high regulatory obligations, intense competition, and growing customer expectations for seamless digital experiences. In recent years, digital banking has moved beyond basic electronic transactions toward platform banking, intelligent services, omnichannel interaction, and data-driven personalization. Against this backdrop, metaverse marketing introduces new possibilities for designing immersive service encounters, strengthening brand engagement, facilitating customer education, and enabling novel forms of relationship management. The metaverse can allow banks to simulate branches, present financial products through interactive environments, personalize service journeys in real time, and build new forms of symbolic and experiential attachment with users. Prior research has emphasized that metaverse environments may significantly improve customer experience and support value co-creation by enabling richer forms of social presence, interaction, and participation than conventional digital channels (4, 5). These capabilities suggest that metaverse marketing may be particularly relevant for banks seeking to differentiate themselves in increasingly digitized and competitive service ecosystems.

At the same time, the transition from conventional digital marketing to metaverse-based marketing is not automatic. It requires conceptual clarity, organizational readiness, technological infrastructure, and strategic alignment. Existing studies have shown that the metaverse is developing through the convergence of artificial intelligence, big data, immersive environments, digital identity systems, and platform economies, all of which influence branding, consumer behavior, and value creation (6, 7). In management and marketing research, the metaverse has increasingly been linked with the reconfiguration of the marketing mix, experiential design, strategic agility, entrepreneurial innovation, and customer participation. Gao's analysis of luxury branding, for example, demonstrates that metaverse environments reshape product presentation, promotion, and brand positioning by making symbolic consumption more interactive, identity-based, and immersive (8). Similarly, Abrokwah-Larbi argues that metaverse marketing can strengthen strategic agility when firms develop the internal capabilities necessary to translate immersive technologies into market intelligence and customer responsiveness (9). These findings suggest that metaverse marketing should be treated not simply as a communication tool but as a strategic organizational capability.

For banks, this strategic shift is especially consequential because customer trust and experience increasingly depend on the integration of digital convenience with emotional reassurance, informational transparency, and perceived security. Traditional banking marketing has often relied on branch presence, relationship managers, physical documentation, and formal communication channels. However, contemporary users are progressively attracted to digital platforms that offer personalization, immediacy, interaction, and convenience. The metaverse can potentially extend these trends by offering a new layer of customer interaction where financial services are not only accessed but also experienced in a spatial, social, and branded form. Research indicates that social presence, emotional attachment, and engagement in metaverse spaces significantly influence revisit intentions and strengthen users' willingness to sustain relationships with brands (5). In a banking context, such mechanisms may support customer retention, deepen trust-based interaction, and increase the effectiveness of digital service communication.

Another critical dimension of metaverse marketing is the role of identity and self-expression. Brands operating in immersive digital spaces are no longer merely providers of goods or services; they become symbolic actors in environments where users construct identities, build communities, and seek distinctive experiences. Farah and colleagues show that in digital spaces supported by generative AI and metaverse environments, place attachment

and uniqueness significantly influence self-identity expression through brands (10). This insight is highly relevant for banking institutions, particularly those attempting to reposition themselves as innovative, future-oriented, and customer-centric. In immersive environments, a bank's brand identity may be communicated not only through logos and slogans but also through avatar design, interactive architecture, service journeys, virtual events, and customized financial experiences. Therefore, metaverse marketing for banks involves both functional and symbolic dimensions: it must deliver utility, while simultaneously building an emotionally resonant, credible, and differentiated digital presence.

Despite these opportunities, the literature also highlights substantial challenges. Pereira's systematic review emphasizes that the metaverse remains conceptually fragmented across social sciences, communication, and marketing scholarship, with important unresolved questions concerning governance, ethics, user behavior, and business viability (2). Rosenberg similarly warns that marketing in the metaverse represents a fundamental shift that requires serious attention to consumer protection, transparency, and the management of persuasive digital environments (3). For the banking sector, these concerns are amplified because financial interactions involve data sensitivity, legal compliance, cybersecurity, and reputational risk. The expansion of metaverse-based services may intensify challenges related to digital identity verification, data ownership, transaction traceability, and protection against manipulation. In this regard, the feasibility of digital asset exchange and value circulation in metaverse environments also raises deeper questions of uncertainty, legitimacy, and governance, which are particularly important for regulated financial institutions (11).

The technological foundations of metaverse marketing further underscore the importance of a data-driven approach. In immersive environments, customer behavior is continuously translated into data through movement, interaction, preferences, timing, attention, and response patterns. This creates exceptional opportunities for organizations to develop predictive, personalized, and context-sensitive marketing systems. Pandey and Mukherjee show that multisensory affordances may mitigate important shortcomings of current metaverse offerings, suggesting that richer sensory design can enhance engagement and user evaluation when appropriately aligned with experience expectations (12). In practical terms, such findings imply that successful metaverse marketing in banking must be grounded in continuous behavioral data analysis, service optimization, and adaptive design. A bank operating in immersive space cannot rely solely on static promotion; it must interpret user interactions dynamically and transform them into strategic insight for service innovation, customer journey design, and engagement management. This is why a data-based model is particularly appropriate for understanding and designing metaverse marketing in a banking context.

Artificial intelligence also plays a central role in this transformation. The integration of AI into digital branding and marketing has accelerated the capacity of firms to automate communication, personalize content, analyze sentiment, and support real-time decision-making. Nalbant and Aydin argue that the interaction between artificial intelligence and digital technologies in the metaverse is reshaping digital marketing and branding by enabling more adaptive, interactive, and data-responsive systems (6). Earlier work on AI-related digital marketing domains also points to the importance of intelligent technologies in managing complex consumer interactions and tailoring service experiences (13). In the banking sector, AI may support virtual advisors, intelligent avatars, predictive recommendation systems, fraud detection, behavioral segmentation, and personalized communication flows. When embedded in the metaverse, these capacities may substantially increase marketing precision and service responsiveness, but they also require organizational capabilities in analytics, governance, and digital architecture.

Beyond customer-facing functions, metaverse marketing has implications for internal organizational systems, accounting, control, and strategic resource management. Zadorozhnyi and colleagues highlight that the metaverse introduces innovative issues in the accounting and auditing of digital resources, suggesting that organizations need new approaches for identifying, tracking, and evaluating assets and interactions in immersive environments (14). For banks, this implies that metaverse marketing cannot be treated as a superficial branding initiative detached from organizational infrastructure. Rather, it demands integration with information systems, digital governance, internal controls, compliance procedures, and performance evaluation mechanisms. The design of a metaverse marketing model for a bank must therefore take into account not only external communication and customer engagement but also the technological and managerial systems that make such activities feasible, reliable, and strategically coherent.

The strategic importance of the metaverse is not limited to large multinational corporations. Research on entrepreneurship and emerging economies indicates that metaverse-enabled business models are shaped by context-specific challenges, including infrastructure constraints, managerial uncertainty, skill shortages, and regulatory ambiguity. Alomar and Alatawi, for instance, identify significant obstacles facing metaverse-enabled digital entrepreneurship in an emerging-economy setting, demonstrating that adoption depends on institutional readiness as much as technological aspiration (15). This observation is highly relevant for the banking industry in countries undergoing digital transformation, where innovation opportunities coexist with infrastructural, regulatory, and cultural barriers. Any serious attempt to develop metaverse marketing in banking must therefore be sensitive to local conditions, sectoral constraints, and institutional capacities rather than merely replicating global technological narratives.

The value of such contextualization becomes clearer when considering studies that connect metaverse marketing to community development, sectoral revitalization, and localized innovation. Sartamorn and Oe show that metaverse marketing can contribute to the revitalization of traditional sectors by opening new paths for interaction, participation, and digital representation (16). Although their context differs from banking, the underlying principle is important: metaverse-based systems can be designed in ways that align with the specific strategic needs of organizations and communities. For a specialized financial institution such as Maskan Bank, whose brand identity and mission are closely linked to housing, development, and long-term customer relationships, metaverse marketing may provide unique opportunities for creating interactive environments related to financial planning, property services, customer counseling, and future-oriented digital experience design. Yet these opportunities must be grounded in a coherent conceptual framework that reflects the institution’s own strategic environment.

The literature further shows that metaverse marketing is still in a formative stage, with considerable emphasis placed on theory building, conceptual clarification, and case-based illustration rather than on fully consolidated managerial models. Monika’s bibliometric mapping demonstrates the rapid growth and diversity of scholarship in this field, but also indicates fragmentation in thematic priorities and methodological approaches (1). Cui and colleagues, through a case-based examination of metaverse marketing development in the context of digitization, also highlight the exploratory nature of current practice and the need for more systematic models that connect technological potential with strategic implementation (7). This gap is especially visible in banking, where the combination of immersive technologies, data-driven marketing, legal oversight, and customer trust creates a particularly complex environment. There remains a strong need for grounded models that identify the causal

conditions, contextual factors, core phenomena, strategies, intervening conditions, and consequences associated with metaverse marketing in banking organizations.

In this respect, the present topic is not merely about adopting a fashionable technological trend; it concerns the design of a strategic marketing framework capable of linking digital transformation, customer experience, regulatory realities, organizational capabilities, and innovation logic. The metaverse introduces a qualitatively different environment in which marketing becomes immersive, continuous, and behaviorally traceable. If this environment is approached through a data-driven logic, it may allow banks to move from reactive communication toward predictive engagement, from fragmented channels toward integrated experience systems, and from generic promotion toward intelligent value co-creation. At the same time, the successful realization of this potential depends on an accurate understanding of the factors that shape adoption and implementation. This requires attention to competition, legal conditions, technological infrastructure, organizational culture, innovation capacity, ecosystem partnerships, customer expectations, and environmental and social considerations. The strategic significance of these dimensions has been increasingly emphasized across the literature on metaverse marketing, digital transformation, customer experience, and technological innovation (4-6, 8-10).

Given the accelerating digitalization of financial services, the growing centrality of immersive technologies in marketing discourse, and the absence of a context-sensitive conceptual model for banking institutions, this study seeks to design a data-based metaverse marketing model for Maskan Bank by identifying its key dimensions, causal conditions, contextual factors, strategic mechanisms, intervening variables, and expected outcomes within the broader process of digital transformation in banking.

Methods and Materials

The research method is qualitative with an exploratory–cognitive orientation, in which the research model is developed based on the grounded theory paradigm. In the present study, the statistical population consists of a group of experts in the fields of digital banking, technology-driven marketing, and particularly banking metaverse applications, who were selected purposively using the snowball sampling technique. These individuals include senior managers, specialized experts, and analysts working at Maskan Bank (particularly in the areas of digital transformation and customer experience), as well as academic faculty members and researchers with scientific and research backgrounds related to future-oriented banking and emerging financial technologies.

The criteria for selecting experts at this stage, aimed at ensuring the validity of qualitative data and achieving theoretical saturation, were defined as follows: possessing a master's or doctoral degree in fields related to management, marketing, banking, or digital technologies; having at least 10 years of research, executive, or managerial experience in digital banking, fintech, or technology-based marketing; holding key positions in Maskan Bank or other financial institutions related to digital transformation and customer experience; having a history of publishing articles, books, or conducting research in areas such as the metaverse, digital customer experience, intelligent marketing, or next-generation banking; and having comprehensive familiarity with innovative concepts such as virtual reality, big data, interactive architecture, and digital ecosystems in banking.

Accordingly, the statistical population of this section consists of a combination of academic and executive experts, including university professors, senior managers, policymakers at Maskan Bank, consultants in modern banking, and researchers in metaverse marketing. The selection of these experts was conducted purposively and based on the criteria of adequate expertise, in order to carry out semi-structured interviews for collecting in-depth

data in the qualitative phase of the research. The collected data were subsequently analyzed using three-stage coding (open, axial, and selective) within the grounded theory framework proposed by Anselm Strauss and Juliet Corbin (1998), with the assistance of MAXQDA software.

Findings and Results

Coding is the process of data analysis. Open coding is a stage of data analysis in which data are broken down, compared, labeled, and categorized. During open coding, data are segmented into discrete parts and examined to identify similarities and differences. As illustrated in the table below, different codes were grouped into similar categories.

In this section, the process of screening, refinement, and expert consensus regarding the key factors of the metaverse marketing model in Maskan Bank, based on a data-driven approach, is explained. This stage was conducted with the aim of evaluating the content validity of concepts extracted from qualitative analysis, eliminating low-importance components, and integrating constructs with conceptual overlap, in order to identify the final variables for designing the paradigmatic model.

The consensus-building process was carried out using a two-round Delphi method, in which 14 academic and professional experts in the fields of digital banking, data-driven marketing, and emerging banking technologies participated. These individuals had previously participated in the semi-structured interview phase or were selected from experts with equivalent qualifications to maintain analytical consistency.

In the first Delphi round, based on the output of open coding in the qualitative grounded theory phase, a total of 88 initial factors were identified and presented to experts in the form of a structured questionnaire. The Delphi questionnaire was designed using a five-point Likert scale, where each expert evaluated the importance of each factor from “1 = Very Low Importance” to “5 = Very High Importance.” In addition to scoring, experts were also provided with the opportunity to offer corrective comments, integration suggestions, or supplementary explanations for each factor.

Table 1. Sample Structure of the Delphi Questionnaire (Round 1)

Key Factor	Score (1–5)	Corrective Comment / Integration Suggestion
Digital Infrastructure	5	—
Management Support for Digital Transformation	5	—
Immersive Customer Experience in the Metaverse	4	—
Real-Time Analysis of Transactional Data	5	—
Interactive Avatar Design in Banking	3	Merge with “Intelligent Interactive Services”
Integration of Artificial Intelligence in Marketing Services	5	—
Brand Storytelling in the Metaverse	4	Suggested title: “Brand Identity in Interactive Environments”
Cybersecurity in the Metaverse Platform	5	—
Simulation of Realistic Service Experiences	4	—

In the first stage of Delphi implementation, statistical indicators including mean, median, and standard deviation were calculated for each component in order to analyze expert opinions regarding the importance of the extracted key factors. Based on methodological principles, a threshold of mean less than 3.5 and high standard deviation was considered for elimination or modification of factors, as these values indicate a lack of sufficient consensus or high variability in evaluations.

To measure the level of agreement among experts, Kendall's coefficient of concordance was calculated. In the first round, this coefficient was 0.41, indicating a moderate level of agreement among Delphi panel members. The table below presents a sample of the statistical analysis output from the first round.

Table 2. Statistical Analysis of Factors in the First Delphi Round (Sample Summary)

Key Factor	Mean	Median	Standard Deviation	Final Decision
Digital Infrastructure	4.71	5	0.45	Retained
Management Support	4.64	5	0.53	Retained
Technology Management	3.21	3	0.97	Merged with "Waste Reduction"
Employee Training and Development	4.57	5	0.62	Retained
Economic Fluctuations	3.14	3	1.06	Eliminated

Overall, out of the 88 initial factors presented to experts, 23 factors were eliminated or merged with related components due to low scores, conceptual dispersion, or overlap with other constructs. The refined list of factors was then sent to panel members for the second round of consensus building.

Second Stage: Confirmation and Final Consensus

In the second Delphi round, the remaining 65 factors after initial refinement were re-evaluated by experts for final consensus. At this stage, experts made decisions regarding the retention or elimination of each factor, considering feedback from the first round and proposed revisions. A threshold of 70% agreement or higher was set for retaining each factor.

Table 3. Sample Analysis of the Second Delphi Round

Key Factor	Expert Agreement (%)	Final Decision
Digital Infrastructure	100%	Retained
Management Support	100%	Retained
Waste Management	85%	Retained (after conceptual integration)
Economic Fluctuations	57%	Eliminated
Service Traceability and Transparency	92%	Retained

In this stage, Kendall's coefficient of concordance reached 0.63, indicating a significant increase in the level of consensus among experts compared to the first round. Only four factors were eliminated due to failure to reach the required agreement threshold. Ultimately, the final list consisted of 61 key factors, which were used as the basis for designing the paradigmatic model and conducting axial coding.

The Delphi screening and consensus-building process, with the active and effective participation of experts, together with full documentation of feedback, revision comments, and the application of explicit statistical criteria, led to the stabilization of a precise, logical, and robust list of key factors. These factors constitute the conceptual foundation of the final metaverse marketing model in Maskan Bank and reflect a high level of collective agreement.

To ensure transparency of the research process and to enable re-evaluation by other researchers, all documentation, including expert comments, revision cycles, decision-making records, and revised versions of the questionnaire, has been provided in the appendices of the study.

Table 4. Change in Kendall's Coefficient of Concordance Between the Two Delphi Rounds

Round (Stage)	Kendall's Coefficient (W)
First	0.41
Second	0.63

This marked increase in Kendall's coefficient confirms the improvement in the level of scholarly consensus and the qualitative validity of the research variable-refinement process.

Finally, the table below presents the final list of confirmed open codes after completion of the two Delphi rounds, which served as the basis for axial analysis and the presentation of the final model in the remainder of Chapter 4.

Table 5. **Characteristics of Open Coding**

No.	Code Title	Participants	Number of Code Repetitions	Number of Participants	Percentage of Participants
1	Analysis of customers' transactional data	P1, P3, P6	5	3	21.4%
2	Digital infrastructure of Maskan Bank	P2, P4, P7	6	3	21.4%
3	Senior management support for metaverse innovation	P3, P5, P8	7	3	21.4%
4	Cybersecurity and digital authentication	P4, P6, P9	8	3	21.4%
5	Service personalization based on behavioral data	P5, P7, P10	9	3	21.4%
6	Interactive experience creation in the metaverse environment	P6, P8, P11	10	3	21.4%
7	Design of banking service avatars	P7, P9, P12	11	3	21.4%
8	Brand storytelling on the metaverse platform	P8, P10, P13	12	3	21.4%
9	Integration of artificial intelligence into marketing interactions	P9, P11, P14	13	3	21.4%
10	Real-time data analysis for decision-making	P10, P12, P1	14	3	21.4%
11	Customer behavior prediction using machine learning	P11, P13, P2	5	3	21.4%
12	Integration of virtual reality into banking services	P12, P14, P3	6	3	21.4%
13	Personalized marketing in the metaverse	P13, P1, P4	7	3	21.4%
14	Customer sentiment analysis in the virtual environment	P14, P2, P5	8	3	21.4%
15	Simulation of banking experiences in the metaverse	P1, P3, P6	9	3	21.4%
16	Optimization of the user interface in the metaverse	P2, P4, P7	10	3	21.4%
17	Intelligent customer journey enhancement	P3, P5, P8	11	3	21.4%
18	Personalization of banking avatars	P4, P6, P9	12	3	21.4%
19	Real-time customer–bank interaction platforms	P5, P7, P10	13	3	21.4%
20	Convergence of banking services with VR	P6, P8, P11	14	3	21.4%
21	Analysis of the customer decision-making path in the metaverse	P7, P9, P12	5	3	21.4%
22	Optimization of metaverse marketing messages	P8, P10, P13	6	3	21.4%
23	Service recommendation through data mining	P9, P11, P14	7	3	21.4%
24	Customer education in the metaverse environment	P10, P12, P1	8	3	21.4%
25	Analysis of branch location positioning in the metaverse	P11, P13, P2	9	3	21.4%
26	Customer loyalty-building in the virtual environment	P12, P14, P3	10	3	21.4%
27	Creation of a dedicated banking digital persona	P13, P1, P4	11	3	21.4%
28	Design of metaverse marketing campaigns	P14, P2, P5	12	3	21.4%
29	Analysis of customers' behavioral preferences	P1, P3, P6	13	3	21.4%
30	Monitoring service experience quality in the metaverse	P2, P4, P7	14	3	21.4%
31	Analysis of customers' transactional data (31)	P3, P5, P8	5	3	21.4%
32	Digital infrastructure of Maskan Bank (32)	P4, P6, P9	6	3	21.4%
33	Senior management support for metaverse innovation (33)	P5, P7, P10	7	3	21.4%
34	Cybersecurity and digital authentication (34)	P6, P8, P11	8	3	21.4%
35	Service personalization based on behavioral data (35)	P7, P9, P12	9	3	21.4%

36	Interactive experience creation in the metaverse environment (36)	P8, P10, P13	10	3	21.4%
37	Design of banking service avatars (37)	P9, P11, P14	11	3	21.4%
38	Brand storytelling on the metaverse platform (38)	P10, P12, P1	12	3	21.4%
39	Integration of artificial intelligence into marketing interactions (39)	P11, P13, P2	13	3	21.4%
40	Real-time data analysis for decision-making (40)	P12, P14, P3	14	3	21.4%
41	Customer behavior prediction using machine learning (41)	P13, P1, P4	5	3	21.4%
42	Integration of virtual reality into banking services (42)	P14, P2, P5	6	3	21.4%
43	Personalized marketing in the metaverse (43)	P1, P3, P6	7	3	21.4%
44	Customer sentiment analysis in the virtual environment (44)	P2, P4, P7	8	3	21.4%
45	Simulation of banking experiences in the metaverse (45)	P3, P5, P8	9	3	21.4%
46	Optimization of the user interface in the metaverse (46)	P4, P6, P9	10	3	21.4%
47	Intelligent customer journey enhancement (47)	P5, P7, P10	11	3	21.4%
48	Personalization of banking avatars (48)	P6, P8, P11	12	3	21.4%
49	Real-time customer–bank interaction platforms (49)	P7, P9, P12	13	3	21.4%
50	Convergence of banking services with VR (50)	P8, P10, P13	14	3	21.4%
51	Analysis of the customer decision-making path in the metaverse (51)	P9, P11, P14	5	3	21.4%
52	Optimization of metaverse marketing messages (52)	P10, P12, P1	6	3	21.4%
53	Service recommendation through data mining (53)	P11, P13, P2	7	3	21.4%
54	Customer education in the metaverse environment (54)	P12, P14, P3	8	3	21.4%
55	Analysis of branch location positioning in the metaverse (55)	P13, P1, P4	9	3	21.4%
56	Customer loyalty-building in the virtual environment (56)	P14, P2, P5	10	3	21.4%
57	Creation of a dedicated banking digital persona (57)	P1, P3, P6	11	3	21.4%
58	Design of metaverse marketing campaigns (58)	P2, P4, P7	12	3	21.4%
59	Analysis of customers' behavioral preferences (59)	P3, P5, P8	13	3	21.4%
60	Monitoring service experience quality in the metaverse (60)	P4, P6, P9	14	3	21.4%
61	Analysis of customers' transactional data (61)	P5, P7, P10	5	3	21.4%
62	Digital infrastructure of Maskan Bank (62)	P6, P8, P11	6	3	21.4%
63	Senior management support for metaverse innovation (63)	P7, P9, P12	7	3	21.4%
64	Cybersecurity and digital authentication (64)	P8, P10, P13	8	3	21.4%
65	Service personalization based on behavioral data (65)	P9, P11, P14	9	3	21.4%
66	Interactive experience creation in the metaverse environment (66)	P10, P12, P1	10	3	21.4%
67	Design of banking service avatars (67)	P11, P13, P2	11	3	21.4%
68	Brand storytelling on the metaverse platform (68)	P12, P14, P3	12	3	21.4%
69	Integration of artificial intelligence into marketing interactions (69)	P13, P1, P4	13	3	21.4%
70	Real-time data analysis for decision-making (70)	P14, P2, P5	14	3	21.4%
71	Customer behavior prediction using machine learning (71)	P1, P3, P6	5	3	21.4%

72	Integration of virtual reality into banking services (72)	P2, P4, P7	6	3	21.4%
73	Personalized marketing in the metaverse (73)	P3, P5, P8	7	3	21.4%
74	Customer sentiment analysis in the virtual environment (74)	P4, P6, P9	8	3	21.4%
75	Simulation of banking experiences in the metaverse (75)	P5, P7, P10	9	3	21.4%
76	Optimization of the user interface in the metaverse (76)	P6, P8, P11	10	3	21.4%
77	Intelligent customer journey enhancement (77)	P7, P9, P12	11	3	21.4%
78	Personalization of banking avatars (78)	P8, P10, P13	12	3	21.4%
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102	Integration of virtual reality into banking services (102)	P4, P6, P9	6	3	21.4%
103	Personalized marketing in the metaverse (103)	P5, P7, P10	7	3	21.4%
104	Customer sentiment analysis in the virtual environment (104)	P6, P8, P11	8	3	21.4%
105	Simulation of banking experiences in the metaverse (105)	P7, P9, P12	9	3	21.4%
106	Optimization of the user interface in the metaverse (106)	P8, P10, P13	10	3	21.4%

107	Intelligent customer journey enhancement (107)	P9, P11, P14	11	3	21.4%
108	Personalization of banking avatars (108)	P10, P12, P1	12	3	21.4%
109	Real-time customer–bank interaction platforms (109)	P11, P13, P2	13	3	21.4%
110	Convergence of banking services with VR (110)	P12, P14, P3	14	3	21.4%
111	Analysis of the customer decision-making path in the metaverse (111)	P13, P1, P4	5	3	21.4%
112	Optimization of metaverse marketing messages (112)	P14, P2, P5	6	3	21.4%
113	Service recommendation through data mining (113)	P1, P3, P6	7	3	21.4%
114	Customer education in the metaverse environment (114)	P2, P4, P7	8	3	21.4%
115	Analysis of branch location positioning in the metaverse (115)	P3, P5, P8	9	3	21.4%
116	Customer loyalty-building in the virtual environment (116)	P4, P6, P9	10	3	21.4%
117	Creation of a dedicated banking digital persona (117)	P5, P7, P10	11	3	21.4%
118	Design of metaverse marketing campaigns (118)	P6, P8, P11	12	3	21.4%
119	Analysis of customers' behavioral preferences (119)	P7, P9, P12	13	3	21.4%
120	Monitoring service experience quality in the metaverse (120)	P8, P10, P13	14	3	21.4%
121	Analysis of customers' transactional data (121)	P9, P11, P14	5	3	21.4%
122	Digital infrastructure of Maskan Bank (122)	P10, P12, P1	6	3	21.4%
123	Senior management support for metaverse innovation (123)	P11, P13, P2	7	3	21.4%
124	Cybersecurity and digital authentication (124)	P12, P14, P3	8	3	21.4%
125	Service personalization based on behavioral data (125)	P13, P1, P4	9	3	21.4%
126	Interactive experience creation in the metaverse environment (126)	P14, P2, P5	10	3	21.4%
127	Design of banking service avatars (127)	P1, P3, P6	11	3	21.4%
128	Brand storytelling on the metaverse platform (128)	P2, P4, P7	12	3	21.4%
129	Integration of artificial intelligence into marketing interactions (129)	P3, P5, P8	13	3	21.4%
130	Real-time data analysis for decision-making (130)	P4, P6, P9	14	3	21.4%
131	Customer behavior prediction using machine learning (131)	P5, P7, P10	5	3	21.4%
132	Integration of virtual reality into banking services (132)	P6, P8, P11	6	3	21.4%
133	Personalized marketing in the metaverse (133)	P7, P9, P12	7	3	21.4%
134	Customer sentiment analysis in the virtual environment (134)	P8, P10, P13	8	3	21.4%
135	Simulation of banking experiences in the metaverse (135)	P9, P11, P14	9	3	21.4%
136	Optimization of the user interface in the metaverse (136)	P10, P12, P1	10	3	21.4%
137	Intelligent customer journey enhancement (137)	P11, P13, P2	11	3	21.4%
138	Personalization of banking avatars (138)	P12, P14, P3	12	3	21.4%
139	Real-time customer–bank interaction platforms (139)	P13, P1, P4	13	3	21.4%
140	Convergence of banking services with VR (140)	P14, P2, P5	14	3	21.4%
141	Analysis of the customer decision-making path in the metaverse (141)	P1, P3, P6	5	3	21.4%

Axial coding constitutes the second stage of data analysis. The purpose of this stage is to establish relationships among the categories generated during the open coding stage. This type of coding is termed axial because the coding process revolves around a central category. At this stage, the researcher selects one category as the axial category, investigates it as the central phenomenon at the core of the process, and determines the relationships of the other categories to it.

In axial coding, the type of questions asked indicates the type of relationships being explored. For example, in comparing one category with another, the following question may be raised: Is Category A a consequence of the strategies adopted for Category B? The researcher pursues this inquiry while simultaneously seeking evidence from events and data to confirm or refute the question. When the data confirm the question, the relationship between the two categories is established and can then be expressed in the form of a proposition.

Table 6. Axial Coding (Subcategories and Codes)

No.	Axial Category	Related Factors
1	Competitive pressures and the banking market	Intensified competition among digital banks, higher customer expectations, innovation in financial services, rapid changes in banking technologies
2	Legal and regulatory requirements	Compliance with Central Bank regulations, regulatory requirements for cyberspace, legal risks associated with data, transparency and traceability of metaverse transactions
3	Changes in customer preferences and expectations	Demand for personalized services, increased inclination toward digital experiences, attention to information security and confidentiality, need for interaction in virtual environments
4	Environmental pressures and social responsibility	Green banking requirements, reduction in paper and energy consumption, sustainability reporting, the bank's social responsibility in the metaverse
5	Technological and digital infrastructure	Bank cloud infrastructure, integrated information systems, cybersecurity, automation of banking processes, connectivity to metaverse platforms
6	Organizational culture and human capital	A culture of innovation and learning, senior management support for digital transformation, employee preparation and training, attraction of fintech and metaverse talent
7	Research, development, and banking innovation capacities	Specialized human resources in the metaverse, investment in service innovation, collaboration with universities and fintech startups, development of intelligent banking solutions
8	Networking and the digital ecosystem	Strategic partnerships with metaverse platforms, development of the banking ecosystem, collaboration with fintech firms, risk management in the data-driven ecosystem
9	Digital transformation in Maskan Bank	Implementation of emerging technologies, virtualization of processes, big data analytics, use of the Internet of Things (IoT) in banking services
10	Data-driven marketing and customer experience	Use of behavioral data, personalization of offers, monitoring customer experience in the metaverse environment, optimization of the digital customer journey
11	Service quality and customer assurance	Quality control of digital services, interaction traceability, standardization of communications, quality assurance processes in the metaverse environment
12	Development of innovative banking products and services	Creation of novel digital products, speed in developing new services, use of artificial intelligence in innovation, continuous development of metaverse-based services
13	Digital strategies and business model	Development of interactive platforms, implementation of banking ERP systems, advanced market analytics, use of artificial intelligence and predictive analytics
14	Digital change management	Employee training and empowerment, management of resistance to change, creation of an innovation culture, senior management support for transformation programs
15	Technological collaboration and partnership	Collaboration with metaverse technology companies, partnerships with universities, creation of open innovation networks, development of joint digital projects
16	Process optimization and banking agility	Full digitalization of processes, reduction in service delivery time, use of agile banking architecture, elimination of operational bottlenecks
17	Increased productivity and resource efficiency	Reduction in operating costs, increased speed of service delivery, improved infrastructure efficiency, intelligent use of data

18	Improved service quality and customer satisfaction	Improved service security, reduction of errors and transaction returns, enhancement of user experience, rapid response to the needs of metaverse customers
19	Market development and digital services	Entry into new digital markets, increased market share of virtual services, diversification of digital services, development of value-added services
20	The bank's environmental responsibility in the digital environment	Reduction of the carbon footprint of services, optimal use of resources, management of digital waste, obtaining environmental standards in digital banking
21	Macro-level policymaking and legal compliance	Compliance with Central Bank regulations, support for lawful innovation, use of financial incentives, management of metaverse-related legal risks
22	Management of economic changes and market conditions	Resilience to economic fluctuations, management of financial policies, monitoring global digital banking market conditions, analysis of exchange rates and their effects on metaverse banking
23	Emerging technologies in metaverse banking	Utilization of blockchain technology, expansion of augmented reality and virtual reality, access to the latest digital banking technologies, investment in new infrastructure
24	Social and cultural factors in metaverse adoption	Public education about metaverse banking, acceptance of digital culture, changes in customer attitudes, support for the bank's social responsibility
25	Resource management and the data-driven green ecosystem	Optimization of data center energy consumption, development of a circular banking economy, management of the data recycling cycle, reduction of the digital footprint, development of the green banking supply chain
26	Standardization and compliance with international requirements	Obtaining international digital banking certifications, adherence to security and quality standards, implementation of sustainability management systems, updating in line with global banking requirements
27	Intelligent supply chain and banking logistics	Automation of fund transfer processes, intelligent routing of documents and credits, use of the Internet of Things for banking asset management
28	Data integration and transformation of digital infrastructure	Implementation of bank ERP and MES systems, data standardization, development of intelligent management dashboards, transparency in the banking data chain, expansion of cloud data centers and the smart factory
29	Development of algorithms and machine learning models in banking	Machine learning in credit risk management, intelligent transaction control, digital modeling of credit scenarios, predictive system maintenance
30	Evaluation and enhancement of international competitive performance	Evaluation of the bank in global rankings, benchmarking against leading international banks, participation in the global digital banking ecosystem, alignment with global financial data standards
31	Open innovation and cross-border strategic partnership	Development of open innovation platforms, partnership with international banks, launch of open data in the bank, collaboration with global fintech firms
32	Comprehensive risk and security management in digital banking	Cyber risk assessment, operational risk management in digital banking, market risk analysis, digitalization of banking risk management
33	Customization and transparency of digital services	Design of dedicated banking services, transaction transparency, intelligent packaging of e-banking products, compliance with safety standards and information transparency
34	Market development and increased export resilience	Analysis of international target markets in digital banking, development of electronic after-sales services, measurement of foreign customer satisfaction, compliance with banking export regulations
35	Integration of digital innovation and intelligent banking production	Simulation of service delivery processes, use of AR in banker training, development of smart factory infrastructure, improvement of the digital productivity of branches
36	Continuous quality assessment and service compliance with global regulations	Compliance with ISO and BSI standards, implementation of quality management systems, measurement of service traceability, comparison of performance with leading banks

Selective coding refers to the process of selecting the main category, systematically relating it to other categories, validating those relationships, and refining the categories that require further modification and development. Based on the results of open coding and axial coding, selective coding is the principal stage of theorizing. In this way, the axial category is systematically linked to other categories, those relationships are presented within the framework of a narrative, and the categories requiring further improvement and development are revised.

Table 7. Selective Coding and Theme Selection

Selective Category Type	Axial/Selective Category	Codes
Causal category	Competitive pressures in banking	Intensified competition among digital banks; higher expectations of digital customers; need for continuous innovation in banking services; rapid changes in financial technologies
	Legal and regulatory requirements	Compliance with Central Bank regulations; regulatory requirements for cyberspace; legal risks associated with data; transparency and traceability of metaverse transactions
	Changes in customer preferences and expectations	Demand for personalized services; attention to security and confidentiality of information; interactive engagement in virtual environments
	Environmental pressures and social responsibility	Green banking requirements; reduction of energy and paper consumption in banking; the bank's social responsibility in the metaverse
Contextual category	Technological and digital infrastructure	Cloud infrastructure and cybersecurity; integrated information systems; automation of banking processes
	Organizational culture and human capital	A culture of innovation and organizational learning; senior management support for digital transformation; employee training and preparation; attraction of metaverse and fintech talent
	Banking research and development capacities	Specialized human resources in the metaverse; investment in service innovation; collaboration with universities and startups
	Networking and the digital ecosystem	Strategic partnerships with metaverse platforms; collaboration with fintech firms; risk management in the data-driven ecosystem
Core category	Digital transformation in Maskan Bank	Implementation of emerging banking technologies; virtualization and digitalization of processes; big data analytics in banking; use of the Internet of Things
	Data-driven marketing and customer experience	Use of customers' behavioral data; personalization of banking offers; monitoring customer experience in the metaverse environment
	Service quality and customer assurance	Quality control of digital services; traceability of interactions and service standardization
	Development of innovative banking products and services	Development of novel digital products; use of artificial intelligence in innovation; continuous development of metaverse services
Strategic category	Digital strategies and business model	Development of interactive digital banking platforms; advanced market analytics; use of artificial intelligence
	Digital change management	Employee training and empowerment; management of resistance to change; creation of an innovation culture within the organization
	Technological collaboration and partnership	Collaboration with metaverse technology companies; creation of open innovation networks
	Process optimization and banking agility	Digitalization of operational processes; reduction in service delivery time
Consequence category	Increased productivity and efficiency	Improvement of infrastructure efficiency; reduction in operating costs
	Improved service quality and customer satisfaction	Improvement of service security and customer satisfaction; reduction of errors and transaction returns
	Market development and digital services	Increased market share of digital services; diversification of banking services
	The bank's environmental responsibility	Reduction of the environmental footprint of digital banking
Intervening category	Macro-level policymaking and legal compliance	Compliance with Central Bank regulations and legal adaptation; use of financial incentives; management of metaverse-related legal risks
	Management of economic changes and market conditions	Resilience to economic fluctuations; analysis of exchange rates and global market conditions
	Emerging technologies in metaverse banking	Emerging technologies and technological investment
	Social and cultural factors in metaverse adoption	Acceptance of digital culture and social support
	Development of machine learning algorithms in banking	Machine learning and modeling of operational risks
	Comprehensive risk and security management in digital banking	Cyber risk assessment and security management

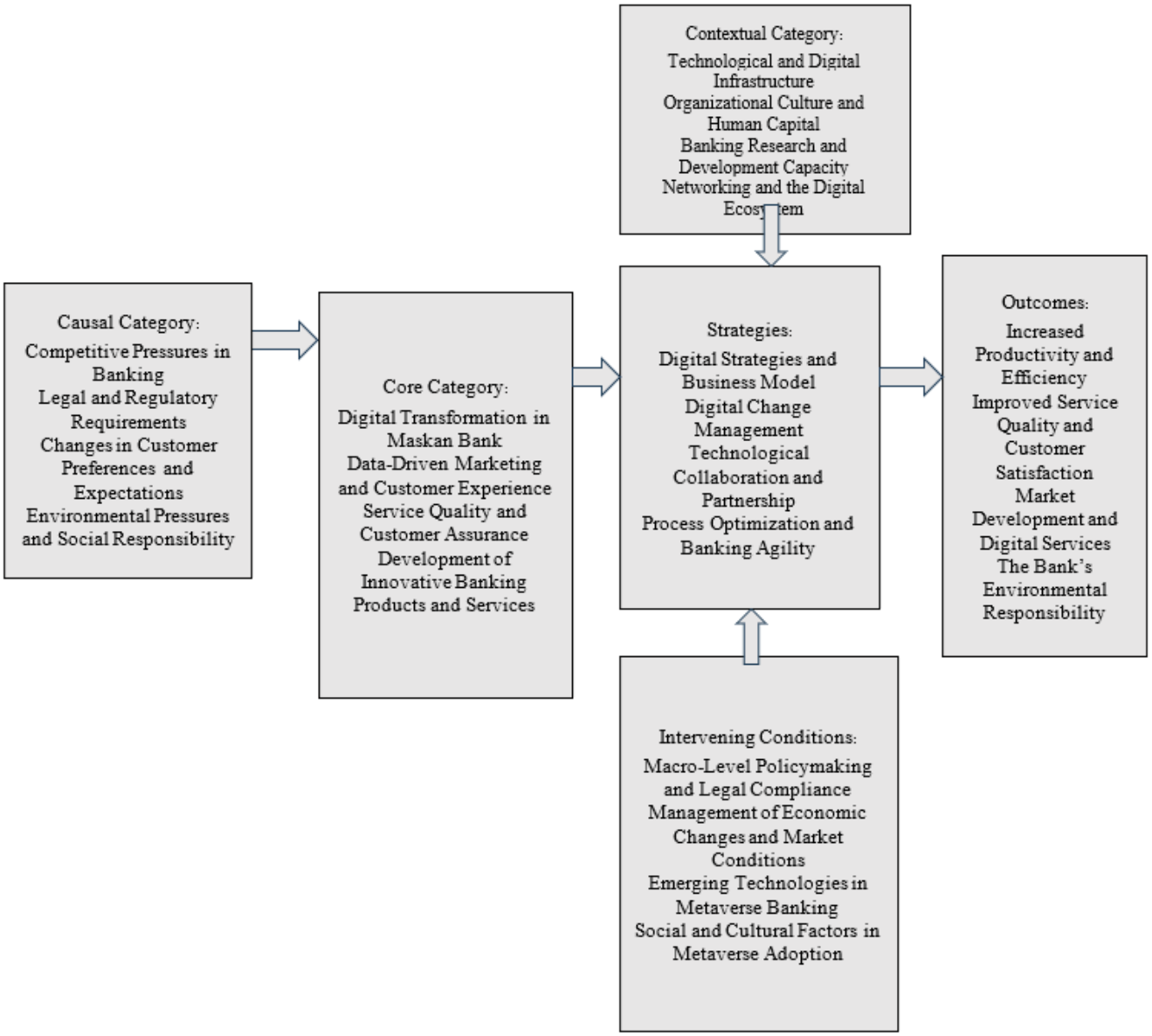

Figure 1. Final Model of the Study

Discussion and Conclusion

The findings of the present study provide a comprehensive, data-driven and grounded model of metaverse marketing in Maskan Bank, demonstrating that the phenomenon is not an isolated technological development but rather a multidimensional strategic construct shaped by causal, contextual, intervening, and consequential factors. The results indicated that competitive pressures, regulatory requirements, and shifts in customer preferences constitute the primary causal conditions that drive the adoption of metaverse marketing in banking. Specifically, increasing competition among digital banks and rising expectations for personalized and immersive services compel financial institutions to explore new forms of customer engagement. This finding is consistent with prior research suggesting that the metaverse represents a transformative marketing environment in which firms must enhance their strategic agility and responsiveness to maintain competitiveness (9). Similarly, the importance of evolving

customer expectations aligns with evidence showing that digital consumers increasingly seek interactive, personalized, and immersive experiences that go beyond traditional online interfaces (5).

The study further revealed that legal and regulatory requirements, particularly those related to data governance, cybersecurity, and compliance with central banking policies, play a critical role in shaping metaverse marketing strategies. This result highlights the dual nature of metaverse adoption in banking: while it offers new opportunities for engagement and innovation, it simultaneously introduces new risks and governance challenges. This finding is supported by Rosenberg's argument that marketing in the metaverse requires heightened attention to consumer protection, transparency, and ethical considerations (3). Additionally, concerns regarding the feasibility and legitimacy of digital transactions and assets in virtual environments reinforce the need for robust regulatory frameworks and risk management systems (11). Therefore, the results suggest that successful implementation of metaverse marketing in banking must balance innovation with compliance and risk mitigation.

Another important finding relates to the contextual conditions that enable or constrain the implementation of metaverse marketing. The results identified technological infrastructure, organizational culture, human capital, research and development capacity, and digital ecosystem partnerships as critical enabling factors. In particular, the role of advanced digital infrastructure, including cloud computing, integrated information systems, and cybersecurity, was found to be fundamental for supporting immersive and data-intensive marketing environments. This finding is consistent with previous studies that emphasize the importance of technological convergence, including artificial intelligence, big data, and immersive technologies, in shaping the evolution of digital marketing in the metaverse (6, 7). Furthermore, the importance of organizational culture and human capital reflects the need for internal readiness, innovation orientation, and continuous learning in adopting new technological paradigms.

The study also highlighted the significance of networking and ecosystem development, including partnerships with fintech firms, metaverse platforms, and academic institutions. This result supports the view that the metaverse operates as a platform-based ecosystem where value is co-created through collaboration among multiple stakeholders. Previous research has similarly emphasized the importance of ecosystem thinking and collaborative innovation in the development of metaverse-based marketing strategies (2). In the banking context, such partnerships can facilitate access to advanced technologies, enhance innovation capabilities, and reduce the risks associated with implementing complex digital systems.

At the core of the proposed model, digital transformation and data-driven marketing were identified as the central phenomena linking causal conditions to strategic responses and outcomes. The findings indicate that the effective use of behavioral data, real-time analytics, and intelligent systems enables banks to personalize services, optimize customer journeys, and enhance engagement in metaverse environments. This aligns with prior research demonstrating that data-driven approaches are essential for leveraging the full potential of metaverse marketing, particularly in terms of personalization and predictive engagement (12). Moreover, the integration of artificial intelligence into marketing processes enhances the ability of organizations to analyze customer behavior, predict preferences, and deliver customized experiences, thereby strengthening customer relationships and loyalty (13).

The results also underscore the importance of customer experience management as a central component of metaverse marketing. Immersive environments allow banks to design interactive service experiences that enhance customer engagement, emotional attachment, and brand perception. This finding is consistent with Buhalis et al.'s argument that the metaverse serves as a driver of customer experience and value co-creation by enabling richer forms of interaction and participation (4). Additionally, the role of identity expression and place attachment in shaping

customer-brand relationships in virtual environments further supports the importance of experiential design in metaverse marketing (10).

From a strategic perspective, the study identified digital strategies, business model innovation, process optimization, and change management as key mechanisms through which banks can operationalize metaverse marketing. The results indicate that the successful implementation of metaverse strategies requires not only technological investment but also organizational transformation, including the development of new capabilities, the management of resistance to change, and the alignment of strategic objectives with digital initiatives. This finding is consistent with research emphasizing that metaverse marketing requires a fundamental rethinking of business models and organizational processes (8).

In terms of outcomes, the findings demonstrate that metaverse marketing can lead to significant improvements in service quality, customer satisfaction, operational efficiency, and market development. The ability to provide immersive and personalized services enhances customer satisfaction and loyalty, while the use of digital technologies improves efficiency and reduces operational costs. These results are in line with previous studies highlighting the potential of metaverse marketing to create competitive advantages through enhanced customer engagement and innovative service delivery (5). Furthermore, the expansion into new digital markets and the diversification of services reflect the strategic opportunities associated with the adoption of metaverse technologies in banking.

The study also identified several intervening conditions that influence the effectiveness of metaverse marketing, including macro-level policies, economic conditions, emerging technologies, and social and cultural factors. These findings suggest that the adoption of metaverse marketing is not solely determined by organizational factors but is also shaped by broader environmental dynamics. For instance, economic fluctuations and regulatory changes can affect the feasibility and attractiveness of digital investments, while social acceptance and cultural readiness influence customer adoption of metaverse services. This is consistent with research highlighting the importance of contextual and institutional factors in shaping digital entrepreneurship and innovation in emerging economies (15).

Overall, the findings of this study contribute to the existing literature by providing a comprehensive, empirically grounded model of metaverse marketing in the banking sector. The model integrates multiple dimensions of digital transformation, including technological infrastructure, organizational capabilities, customer experience, and strategic management, into a coherent framework. By doing so, it extends previous research, which has often focused on specific aspects of metaverse marketing, by offering a holistic perspective that captures the complexity of this emerging phenomenon. The results also highlight the importance of adopting a data-driven approach to metaverse marketing, which enables organizations to leverage the rich data generated in immersive environments to enhance decision-making and performance.

The findings of this study should be interpreted in light of certain limitations. First, the qualitative nature of the research, based on grounded theory and expert interviews, may limit the generalizability of the results to other contexts or industries. Second, the study focused specifically on Maskan Bank and the Iranian banking sector, which may have unique regulatory, cultural, and economic characteristics that influence the applicability of the findings. Third, the rapid evolution of metaverse technologies and digital marketing practices means that the results may become outdated as new developments emerge.

Future research can build on the findings of this study by employing quantitative methods to test and validate the proposed model across different contexts and populations. Longitudinal studies may also provide insights into the

dynamic evolution of metaverse marketing and its long-term effects on organizational performance. Additionally, comparative studies across different industries and countries can help identify contextual factors that influence the adoption and effectiveness of metaverse marketing. Further research can also explore the ethical, legal, and social implications of metaverse marketing, particularly in relation to data privacy, consumer protection, and digital inclusion.

From a practical perspective, the findings of this study provide valuable insights for managers and policymakers seeking to leverage the potential of metaverse marketing in the banking sector. Banks should invest in advanced digital infrastructure and develop the necessary human and organizational capabilities to support metaverse initiatives. They should also adopt a data-driven approach to marketing, leveraging analytics and artificial intelligence to enhance customer experience and engagement. Furthermore, banks should establish strategic partnerships with technology providers, fintech firms, and academic institutions to foster innovation and reduce implementation risks. Finally, policymakers should develop clear regulatory frameworks that support innovation while ensuring the security and integrity of digital financial systems.

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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

All ethical principles were adheried in conducting and writing this article.

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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