Intelligent Marketing Model with a Focus on Artificial Intelligence in the Banking Industry

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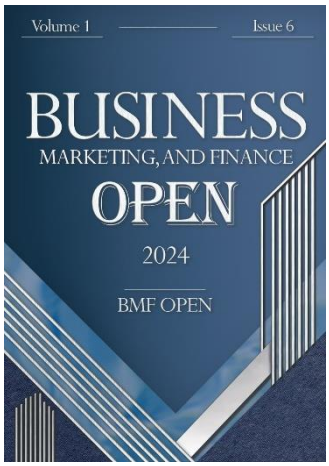

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Abstract: In today's world, emerging technologies, especially artificial intelligence, have brought significant transformations to various industries, particularly in banking. Banks need to adopt artificial intelligence-based intelligent marketing models to maintain competitiveness and enhance customer experience. Therefore, the aim of this research is to design an artificial intelligence-based intelligent marketing model for the banking industry. The research method employed in this study is a descriptive survey, and from the perspective of its objective, the research is developmental and applied. Given the qualitative nature of the study, its credibility was evaluated and confirmed through suitability and applicability criteria. Sampling was carried out using the snowball sampling method. The research population consisted of university professors, managers, and experts in the banking industry, and the sample size was determined based on the principle of theoretical saturation. Ultimately, data for this study were collected through semi-structured interviews with 17 participants. Based on the results from qualitative analysis, 17 themes were extracted, including artificial intelligence and emerging technologies, customer needs and expectations, advancements in information and communication technology, competition in the banking industry, and changes in consumer behavior. Other identified themes were the formation of intelligent marketing, recognition of the competitive environment in the banking industry, regulatory and legislative systems, massive data volumes, organizational culture, information technology infrastructure, organizational support, investment in technology, and legal and ethical limitations. Additionally, themes such as intelligent marketing in the banking industry, implementation of artificial intelligence systems, market trend prediction, marketing automation, customer-centric service development, customer satisfaction improvement, financial performance improvement, customer experience enhancement, targeted marketing, and risk and security management were identified. Finally, to determine causal relationships and hierarchical levels among these themes, Interpretive Structural Modeling (ISM) was used, resulting in the classification of themes into 12 levels.

Keywords: Intelligent marketing, artificial intelligence, banking industry.

1. Introduction

Banks today are considered one of the most important financial institutions in every country, playing a fundamental role in ensuring liquidity, maintaining economic stability, and enhancing the quality of life. These institutions not only offer a wide range of financial services but also play a major role in the economic growth and development of various countries. However, due to increasing competition among banks and pressures arising

from the need to enhance customer satisfaction, banks are compelled to develop and implement innovative strategies to attract and retain customers. One of these strategies is intelligent marketing, which, especially when utilizing advanced tools such as Artificial Intelligence (AI), can offer significant benefits to banks [1].

Intelligent marketing, with a focus on AI, is one of the newest and most effective tools that can help banks analyze big data, simulate customer behaviors, and predict their future needs. AI, with its ability to process vast amounts of data and make quick, intelligent decisions, has the potential to revolutionize marketing processes in banks [2]. In this regard, many researchers argue that the use of intelligent marketing strategies is essential for gaining a competitive advantage in the banking industry [3].

Today, competition in the banking industry has reached a level where banks must provide services that not only excel in quality but also lead in processes and technological innovations compared to their competitors. In this context, intelligent marketing can play a vital role in transforming the banking industry. Given that the competitive environment and rapid market changes require quick and accurate responses, AI can serve as a powerful tool for analyzing customer behavior and predicting their future needs, which ultimately contributes to the growth and improved performance of banks [4].

Especially in countries facing economic challenges and sanctions, such as Iran, banks need to seek ways to improve their performance and attract customers. In such conditions, the use of advanced technologies like AI in intelligent marketing can serve as a competitive advantage, increase market share, and ultimately help improve profitability [2]. While banks in developed countries extensively use these technologies in their marketing processes, countries like Iran can also benefit from adopting these technologies to offer better services [5].

AI, particularly when combined with big data, enables banks to carry out their marketing processes intelligently and purposefully. Through precise data analysis, customer needs prediction, and optimization of marketing processes, banks can attract new customers and retain existing ones. This approach not only increases revenue and profitability but also helps banks stay ahead of other financial institutions [6].

Furthermore, one of the major challenges in intelligent marketing is determining effective methods for implementing these strategies in the banking industry. Since AI refers to systems capable of learning and making intelligent decisions, questions arise regarding the accountability and decision-making processes of these systems in marketing [7]. Therefore, banks and financial institutions must develop strategies that leverage AI capabilities while also considering social, legal, and ethical responsibilities [8].

The role of AI in banking and marketing has been widely discussed in recent studies, highlighting its transformative potential. Afshar et al. (2021) examined a smart marketing model in Iran's mushroom industry, identifying key factors that convert latent markets into active ones [9]. Ashouri Roudposhti et al. (2021) focused on a neural network-based classification model for liquidity risk management, demonstrating the automatic categorization of risks through digital marketing services [10]. In a similar vein, Abu Al-Masoom et al. (2021) proposed a smart marketing model for Sina Paya Investment Company, showing that 13 core components and 42 indicators are crucial in marketing decision-making [11]. Rajaei and Arast (2019) explored the impact of marketing and business strategies on the performance of Bank Melli Zanjan, concluding that marketing strategies significantly affect bank performance [12]. Esfandiari and Esfiedani (2019) highlighted how inter-organizational marketing strategies and supply chain management influence growth in the banking sector [13]. Gholami (2019) emphasized the importance of marketing strategies in the profitability and market share of Hekmat Iranian Bank [14]. More recently, global research by Hrytsenko et al. (2024) identified the role of intelligent technologies such as AI and blockchain in enhancing banking efficiency and competitiveness, albeit with lower adoption rates in Ukraine [15].

Similarly, Polireddi (2024) demonstrated how AI and machine learning contribute to improving efficiency, cybersecurity, and risk reduction in banking. Nagarajan and Arunadov (2023) found that customer acceptance of AI in banking is positively influenced by perceived usefulness and recognition, while perceived risk has a negative impact [1]. Todorova and Antonova (2023) explored the use of AI in smart marketing solutions, highlighting its role in enhancing marketing effectiveness through automation [16]. Nalini et al. (2021) discussed AI's emerging role in banking, particularly in automated decision-making and marketing [17]. Akyuz and Mavnacioglu (2021) examined how AI is revolutionizing marketing and customer service in banking, positioning AI as a competitive advantage in financial marketing [18]. Similarly, Savelyeva and Timkina (2021) discussed how intelligent technologies regulate competition among banks in cross-border markets, emphasizing the role of digitalization [19]. Finally, Singh and Patak (2020) underscored AI's role in improving the performance of banks and digital payment systems, further corroborating the pivotal role of AI in banking advancements [20]. These studies underscore the significant contributions of AI to smart marketing in banking, offering insight into its potential for improving customer experience, decision-making, and operational efficiency.

The main goal of this research is to design an intelligent marketing model focusing on AI for the banking industry. This model can help banks optimize their marketing strategies using modern technologies, especially AI, and leverage its benefits for growth and profitability improvement. In this regard, it is essential for banking institutions to shift their marketing perspectives and integrate AI-based strategies into their processes so that they can withstand future competitive challenges and gain a larger market share. Ultimately, considering the increasing importance of emerging technologies in the banking industry, this research aims to create a suitable model for AI-based intelligent marketing that can transform the banking industry in the country and assist in achieving sustainable competitive advantage.

2. Methodology

In the present study, a mixed research approach (qualitative-quantitative) was utilized. This research is categorized as developmental in terms of its objective and falls under descriptive-analytical studies in terms of its nature. The research was conducted in two main phases:

Phase One - Qualitative Analysis: In this phase, qualitative data were initially collected through semi-structured interviews with experts and specialists in the fields of e-commerce and artificial intelligence. The interview questions specifically focused on identifying and examining factors related to the use of AI in e-commerce. Non-probabilistic purposive sampling was employed, and all interviews were recorded. After the interviews were completed, thematic analysis was conducted to identify the main factors.

Phase Two - Quantitative Analysis: In the ISM method, the qualitative data extracted from the thematic analysis are converted into relational matrices. These matrices show the relationships between different factors, and using them, the relationships among various variables can be simulated and analyzed. In this phase, specialists and experts make decisions regarding the type and intensity of relationships between different factors. Subsequently, a structural model and the relationships among factors are simulated and extracted.

The statistical population of this research includes university professors specializing in artificial intelligence, digital marketing, and AI-based intelligent marketing strategies, as well as managers and experts in digital banking at Bank Mellat. These individuals have practical experience in optimizing marketing processes using AI and can provide valuable insights into the challenges and opportunities in this field. The managers and experts at Bank

Mellat hold Master's degrees in related fields and work at both managerial and executive levels. Additionally, university faculty members with expertise in AI and digital marketing were selected as experts.

To select members of the statistical population, both judgmental and snowball sampling techniques were used. In judgmental sampling, the researchers purposefully selected experts in the relevant fields. In snowball sampling, after each interview, the interviewees were asked to refer other individuals with similar expertise. This process continued until theoretical saturation was reached, and ultimately, 17 interviews were conducted.

For data analysis in this study, two methods were employed: thematic analysis and Interpretive Structural Modeling (ISM). The six steps of thematic analysis are as follows: familiarization with the data, creating initial codes, searching for themes, reviewing themes, defining and naming themes, and preparing the report. The steps of the ISM method are briefly outlined as: identifying relevant indicators to the issue, forming the structural self-interaction matrix, forming the initial reachability matrix, forming the final reachability matrix, determining the level of indicators, drawing the structural interpretive model, and analyzing the power of influence and dependency.

The data collection tools used in this research included library studies for reviewing the theoretical foundations, semi-structured interviews for gathering opinions from the statistical population for thematic analysis, and questionnaires for designing the interpretive structural model.

To ensure the scientific accuracy and reliability of the qualitative research, four criteria must be considered: credibility, dependability, confirmability, and transferability (Creswell, 2007). To enhance the credibility of the study, the interview process continued until theoretical saturation was achieved. Moreover, the content validity ratio was estimated at 0.75, indicating maximum theoretical consensus among the experts. To measure reliability or dependability, Cohen's Kappa coefficient was used. Given that the Kappa index of 0.72 was statistically significant at a level lower than 0.05, the agreement between the researcher and the second coder was confirmed. To increase the confirmability of the study, all interviews were recorded to allow for re-listening and reviewing in subsequent visits. Furthermore, all discussions with the interviewees were separately noted. To enhance transferability, efforts were made to ensure that the research was conducted and analyzed in a way that the findings could be applicable in similar contexts.

3. Findings

Out of a total of 17 participants, 14 (82.0%) were male and 3 (18.0%) were female. This reflects a male dominance in the sample, which may be attributed to cultural, social, or professional reasons. The highest frequency was observed in the age group of under 35 years, with 8 individuals (47.0%). Following that, 7 individuals (42.0%) were in the age group of 35 to 45 years, and only 2 individuals (11.0%) were 45 years or older. This age distribution indicates that the expert population is relatively young, which may suggest innovation and new perspectives in various areas. In terms of education, 10 individuals (58.0%) held Master's degrees and 7 individuals (42.0%) held Doctoral degrees. This distribution demonstrates a high level of education among the experts, which can influence the quality and credibility of their opinions and findings. Regarding work experience, 7 individuals (42.0%) had between 10 to 20 years of experience, and 10 individuals (58.0%) had over 20 years of experience.

Based on the interviews conducted with experts, the interviews were analyzed using line-by-line content analysis, phrase-by-phrase analysis, and general conceptualization. Concepts were categorized based on similarities in meaning and concepts. Below are a few examples from the interviews with experts:

Interview 1: In this interview, it was stated that "using artificial intelligence, banks can provide various tools to make financial management easier for customers. For example, a bank can offer a personalized financial plan to a customer using AI or provide financial alerts to the customer." Extracted code: Easier financial management

Interview 2: One of the key responses in this interview was, "With artificial intelligence, banks can personalize their services to match customers' needs. For instance, a bank can provide a personalized financial plan to a customer using their information, or suggest relevant banking products and services based on the customer's behavioral patterns." Extracted code: Personalizing services

Interview 3: In this interview, it was said that "Natural Language Processing helps banks interact with customers in a natural language. Using intelligent chatbots, customers can ask questions verbally or in writing and receive automatic responses." Extracted code: Natural language processing

Interview 4: One point raised in this interview was, "Today's customers expect banking services to be available 24/7 through online and digital channels. Banks must meet this customer need by providing banking services via websites, mobile apps, and other digital channels." Extracted code: Increased expectations for online and digital services

Interview 5: This interview highlighted, "One of the main challenges in implementing intelligent marketing models is adhering to regulations regarding customer data privacy. Banks must ensure they use customer data legally and ethically." Extracted code: Regulations related to customer data

Through coding the interview texts, 158 concepts were extracted, and due to semantic and conceptual similarities, they were grouped into 21 categories. At this stage, 158 base codes with 80 sub-components and 21 main components were identified from the interview texts. Table 1 shows the coding process stages.

Table 1. Main and Sub-components

Main Component	Sub-components
Artificial Intelligence and New Technologies	Machine learning, Natural language processing, Big data analysis
Customer Needs and Expectations	Personalizing services, Increased expectations for online and digital services, Speed and ease of service delivery, Easier financial management
Advances in Information and Communication Technology	Rapid development of AI technologies, Expanding access to the internet and data
Competition in the Banking Industry	Emergence of fintechs, Competition to attract new customers
Changes in Consumer Behavior	Willingness to use digital banking, Increasing concerns about data security
Competitive Environment in the Banking Industry	Number of existing financial institutions and banks, Intense competition among banks, Entry of new competitors, Industry trends and their impact on marketing
Regulatory and Legal Systems	Laws and regulations regarding customer data, Regulations related to providing financial services, Changes in laws and regulations, Legal standards related to the use of AI
Massive Data in the Banking Industry	Transaction data, Online behavior data, Market data
Organizational Culture	Acceptance and adoption of technology among employees, Understanding and acceptance of AI, Managerial support for innovations
Information Technology Infrastructure	Banking information systems capabilities, Big data processing ability, Presence of AI platforms, Currency and metaverse transaction security, Cybersecurity and data privacy
Organizational Support and Investment in Technology	Strategic leadership and vision, AI specialist teams, Budget allocation
Legal and Ethical Constraints	Regulations regarding advertising and marketing, Data privacy laws, Legal limitations in AI usage, Ethical issues
Intelligent Marketing in the Banking Industry	Using AI to analyze customer data, Creating data-driven marketing campaigns

Implementation of AI Systems	Training employees in new technologies, Detecting patterns and anomalies, Integrating AI systems into marketing processes
Market Trend Forecasting	Analyzing economic and financial trends, Simulating scenarios, Analyzing market sentiment, Identifying new market opportunities
Marketing Automation	Using chatbots for customer communication, Managing automated advertising campaigns, Optimizing scheduling and communication channels, Automatically sending emails and promotional messages
Customer-Centric Service Development	Designing interactive customer experiences, Offering personalized financial advice, Providing 24/7 support via chatbots and virtual assistants, Metaverse payments, Offering metaverse loans, Analyzing customer feedback for service improvement, Providing products and services tailored to customer needs
Customer Satisfaction Enhancement	Improving customer experience, Identifying and resolving customer issues, Increasing customer loyalty
Financial Performance Improvement	Increasing revenue, Identifying new revenue opportunities, Improving operational efficiency, Reducing marketing costs
Improving Customer Experience	Analyzing customer sentiment, Personalized customer experience, Quick and efficient communication, Complaint management
Targeted Marketing	More precise targeting of advertisements based on customer behavior analysis, Identifying potential customers, Targeted marketing in the metaverse, Advertising through the metaverse, Optimizing communication channels, Precise market segmentation
Risk and Security Management	Fraud detection, Customer credit evaluation, Identifying and preventing fraud, Improving cybersecurity

Interpretive Structural Modeling (ISM) is a modeling technique that suggests the use of expert opinions based on various management techniques such as brainstorming, nominal group technique, and others, to develop contextual relationships between variables. In this study, 15 experts were used to identify the contextual relationships between the selected codes. For the analysis of the selected codes, a "leads to" type of contextual relationship was chosen. This implies that one variable leads to another. Accordingly, a contextual relationship between the variables is created. The factors related to the use of artificial intelligence in e-commerce were identified through open, axial, and selective coding, which include the selected codes specified in Table 2.

Table 2. List of Selected Codes for Factors Related to Intelligent Marketing with a Focus on Artificial Intelligence in the Banking Industry

Component	Symbol	Component	Symbol
12	Organizational Culture	1	Artificial Intelligence and New Technologies
13	Improving Customer Experience	2	Organizational Support and Investment in Technology
14	Competition in the Banking Industry	3	Marketing Automation
15	Competition in the Banking Industry	4	Information Technology Infrastructure
16	Big Data in the Banking Industry	5	Development of Customer-Centric Services
17	Competitive Environment in Banking	6	Legal and Ethical Limitations
18	Changes in Consumer Behavior	7	Targeted Marketing
19	Customer Needs and Expectations	8	Predicting Market Trends
20	Advances in Information and Communication Technology	9	Increasing Customer Satisfaction
21	Risk and Security Management	10	Implementation of AI Systems
		11	Improving Financial Performance

The relationships between these factors were captured in the Structural Self-Interaction Matrix (SSIM), which was constructed based on expert opinions. The SSIM was then used to derive the Initial Access Matrix by converting the relationship symbols to binary values, which reflect the direct and indirect influence between components.

Following this, the next step involved the construction of the Reachability Matrix. This matrix is derived from the Initial Access Matrix and shows the transitive closure of the system, allowing us to identify the direct and

indirect relationships between components. The reachability matrix is crucial for understanding the flow of influence between different factors in the model.

Table 3. Reachability Matrix

Strategic Goals	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2	1	1	0	1	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0
3	0	1	1	0	1	1	0	1	0	1	0	1	0	0	0	1	1	0	0	0	0
4	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0
5	0	1	1	0	1	1	0	1	0	1	0	1	0	0	0	1	1	0	0	0	0
6	1	0	1	0	0	0	0	1	1	0	0	0	0	0	0	1	0	1	0	0	0
7	0	0	0	1	1	1	0	1	1	0	0	1	0	0	1	1	0	1	1	1	0
8	1	0	0	1	0	0	1	0	0	0	0	1	0	1	1	1	1	0	1	0	0
9	0	0	1	0	0	1	0	1	0	0	0	0	0	1	1	1	1	0	1	0	0
10	1	0	0	1	0	0	0	1	0	1	0	0	0	0	1	0	0	1	0	1	0
11	1	0	1	0	0	1	0	0	1	0	0	0	1	0	0	0	0	0	0	0	1
12	0	1	0	1	0	0	0	0	0	0	1	0	1	0	1	0	0	0	0	0	0
13	1	0	0	0	0	1	0	0	1	1	1	0	0	1	0	0	0	0	0	0	0
14	0	1	0	1	0	0	0	1	0	0	1	0	0	1	1	1	0	0	0	0	0
15	1	0	1	0	0	1	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0
16	1	0	0	1	1	1	0	0	0	1	1	0	0	1	0	0	0	0	0	0	0
17	1	0	0	1	0	1	1	0	0	0	0	0	1	0	1	0	1	0	0	0	0
18	0	0	1	0	0	1	0	1	0	0	0	1	0	1	0	0	0	0	1	0	0
19	0	0	1	0	0	0	0	1	0	0	0	0	0	1	0	0	0	1	1	0	0
20	0	0	0	1	0	0	1	1	0	0	1	0	1	1	1	0	1	0	0	0	0
21	0	1	0	1	0	1	0	0	0	0	1	0	0	0	0	0	0	1	0	1	0

The reachability matrix helps visualize how the various components in the model interact, revealing how one factor may influence others directly or indirectly. From this matrix, the transitive relationships between the components can be identified, which are crucial for understanding the dynamics of intelligent marketing strategies in the banking industry.

Table 4. Input and Output Sets for Determining Levels

Component	Goal	Preceding Set (Vi)A	Succeeding Set (Vi)R	Common Set (Vi)A ∩ (Si)R = (Si)R	Level
Artificial Intelligence and New Technologies	1	1	1-2-3-4-5-6-7-8-9-10-11-12-13-14-15-16-17-18-19-20-21	1	First
Organizational Support and Investment in Technology	2	1-2-4-15-18-19-20	2-3-5-6-7-8-9-10-11-12-13-14-16-17-21	2	Fifth
Marketing Automation	3	1-2-3-4-5-6-8-10-12-15-16-17-18-19-20	3-5-7-9-11-13-14-21	3-5	Eighth
Information Technology Infrastructure	4	1-4-15-18-19-20	2-3-4-5-6-7-8-9-10-11-12-13-14-16-17-21	4	Fourth
Customer-Centric Service Development	5	1-2-3-4-5-6-8-10-12-15-16-17-18-19-20	3-5-7-9-11-13-14-21	3-5	Eighth

Legal and Ethical Constraints	6	1-2-4-6-15-18-19-20	3-5-6-7-8-9-10-11-12-13-14-16-17-21	6	Sixth
Targeted Marketing	7	1-2-3-4-5-6-7-8-9-10-11-12-13-15-16-17-18-19-21	7-14-21	7-21	Eleventh
Market Trend Prediction	8	1-2-4-6-8-10-12-15-16-17-18-19-20	3-5-7-8-9-10-11-12-13-14-16-17-21	8-10-12-16-17	Seventh
Customer Satisfaction Enhancement	9	1-2-3-4-5-6-8-9-10-12-15-16-17-18-19-20	7-9-11-13-14-21	9	Ninth
Artificial Intelligence System Implementation	10	1-2-4-6-8-10-12-15-16-17-18-19-20	3-5-7-8-9-10-11-12-13-14-16-17-21	8-10-12-16-17	Seventh
Financial Performance Improvement	11	1-2-3-4-5-6-8-9-10-11-12-15-16-17-18-19-20	7-11-14-21	11	Tenth
Organizational Culture	12	1-2-4-6-8-10-12-15-16-17-18-19-20	3-5-7-8-9-10-11-12-13-14-16-17-21	8-10-12-16-17	Seventh
Customer Experience Enhancement	13	1-2-3-4-5-6-8-9-10-12-13-15-16-17-18-19-20	7-13-14-21	13	Tenth
Banking Industry Competition	14	1-2-3-4-5-6-7-8-9-10-11-12-13-14-15-16-17-18-19	14	14	Twelfth
Banking Industry Competition	15	1-15-18-19-20	2-3-4-5-6-7-8-9-10-11-12-13-14-15-16-17-18-20	15-18	Third
Big Data in the Banking Industry	16	1-2-4-6-8-10-12-15-16-17-18-19-20	3-5-7-8-9-10-11-12-13-14-16-17-21	8-10-12-16-17	Seventh
Competitive Environment in the Banking Industry	17	1-2-4-6-8-10-12-15-16-17-18-19-20	3-5-7-8-9-10-11-12-13-14-16-17-21	8-10-12-16-17	Seventh
Changes in Consumer Behavior	18	1-15-18-19-20	2-3-4-5-6-7-8-9-10-11-12-13-14-15-16-17-18-21	15-18	Third
Customer Needs and Expectations	19	1-19	2-3-4-5-6-7-8-9-10-11-12-13-14-15-16-17-18-19-21	19	Second
Information and Communication Technology Advancements	20	1-20	2-3-4-5-6-7-8-9-10-11-12-13-14-15-16-17-18-20-21	20	Second
Risk Management and Security	21	1-2-3-4-5-6-7-8-9-10-11-12-13-15-16-17-18-19-21	7-14-21	7-21	Eleventh

Based on Table 4, and following the steps described in the "Methods" section, the Interpretive Structural Model (ISM) was drawn and the final model was obtained as shown in Figure 1.

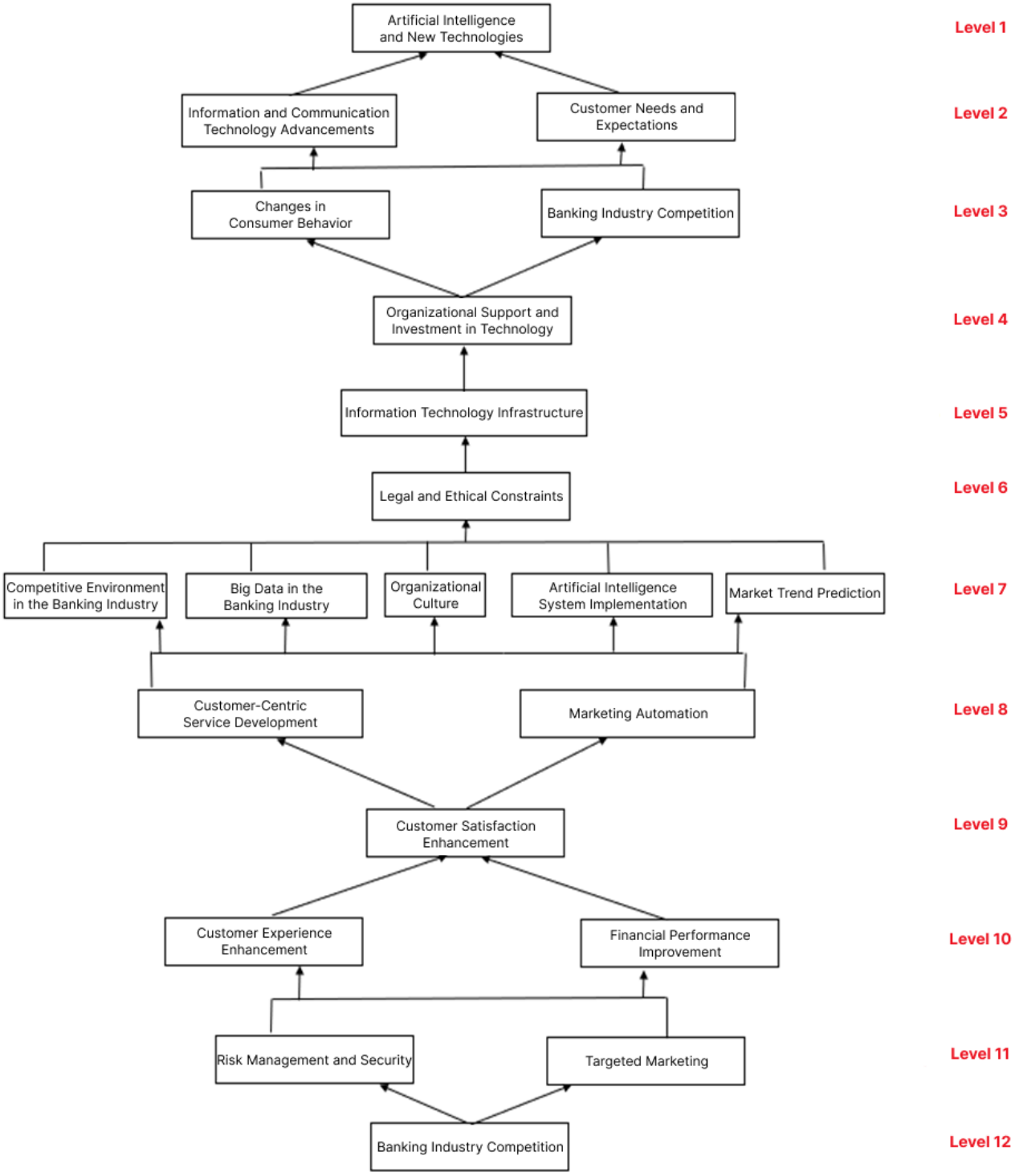

Figure 1. Model of Factors Influencing Intelligent Marketing with a Focus on Artificial Intelligence in the Banking Industry

The final model with the identified variables is displayed in Figure 2. This diagram only considers the meaningful relationships between the elements of each level with the elements of the level below, as well as the meaningful internal relationships within each row.

Power-Dependency Analysis: In the ISM model, the reciprocal relationships and impacts between criteria, as well as the connections between criteria at different levels, are clearly depicted. This enables a better understanding

of the decision-making environment for managers. To determine the key criteria, the power-dependency matrix is formed from the final reachability matrix.

In the power-dependency analysis, variables are categorized into four groups based on their influence and dependence:

1. **Autonomous Variables**: These have low power and low dependence. These variables are relatively disconnected from the system and have weak relationships with other elements.
2. **Dependent Variables**: These have low influence but high dependence.
3. **Linking Variables**: These have both high influence and high dependence. These variables are dynamic, as any change in them can affect the system, and feedback from the system can, in turn, alter these variables.
4. **Independent Variables**: These have strong influence but weak dependence. These are considered key variables.

Accordingly, the power-dependency analysis shows that the variables of risk management and security, as well as competition in the banking industry, have high influence and low dependence, positioning them as independent variables. Artificial intelligence and new technologies, customer needs and expectations, and advancements in information and communication technology exhibit high dependence but low influence, making them dependent variables. Market trend prediction, AI system implementation, big data in the banking industry, and the competitive environment in the banking industry all have similar levels of influence and dependence, categorizing them as linking variables. It is noteworthy that no variable falls into the first quadrant, which is the autonomous region.

4. Discussion and Conclusion

In today's world, digital transformation in the banking industry, especially through new technologies such as Artificial Intelligence (AI), has led to significant changes in marketing practices and customer services. The results of this study indicate that designing an AI-based smart marketing model in banking not only helps improve customer experience and increase their satisfaction but also optimizes financial performance and creates a competitive advantage for banks. The findings from qualitative analysis and Interpretive Structural Modeling (ISM) show that 21 different factors, across 12 levels, influence smart marketing in the banking industry.

One of the most important outcomes of this research is the identification of the relationships between various factors in this model. For example, AI and new technologies, as the main drivers of transformation in banking, create a need for appropriate IT infrastructure and communication advancements, without which AI systems cannot be implemented. Moreover, accurately understanding customer needs and expectations and aligning services with these needs enables banks to improve the customer experience and enhance customer satisfaction through targeted marketing.

Other factors, such as competition in the banking industry, changes in consumer behavior, and legal and ethical constraints, also play a crucial role in shaping smart marketing strategies. Increased competition in the market forces banks to utilize AI in order to maintain their competitive edge. Additionally, changes in consumer behavior, especially the increased use of online services, compel banks to alter their marketing strategies and service delivery. Jandor (2021) examined the opportunities and challenges of using AI in banking and concluded that AI can assist banks in areas such as personalized services, transaction security, process automation, and customer experience improvement. These findings align with those of the present study regarding AI’s ability to provide personalized services and enhance customer experience, especially through the use of big data and machine learning. Singh and

Patak (2020) in their study on the use of AI in banking in India emphasized the importance of technological advancements such as natural language processing, machine learning, and data analytics in improving bank performance. These results are consistent with sections of the current study, which discusses the use of new technologies for big data analysis and identifying customer behavior patterns. In the research by Akyoz and Mavanjoglu (2021), changes resulting from advancements in AI in banking marketing were examined, with a focus on AI's capabilities in enhancing customer experience and providing better services. This aligns with the present study, which highlights the role of AI in customer-centric service development and increasing customer satisfaction and loyalty.

Finally, this research, by providing an AI-based smart marketing model, identifies the various dimensions of this model and the obstacles to its implementation. It helps bank managers understand the challenges and opportunities at hand and adopt better strategies to improve performance and enhance customer satisfaction. Additionally, the findings of this study can serve as a foundation for future research in the fields of digital marketing and technological innovations in the banking industry. For the managers at Bank Mellat, the technology department of Bank Mellat, and AI specialists, the following practical and actionable recommendations for utilizing smart marketing with a focus on AI in the banking industry are proposed:

1. Use AI algorithms to predict customer behavior and align marketing strategies based on these predictions.
2. Develop AI-based decision support systems that, through the analysis of big data, enable bank managers to make better and faster decisions.
3. Provide personalized recommendations based on data analysis and AI algorithms to improve customers' purchasing experience and increase their satisfaction.
4. Use AI to detect and predict security threats and prevent fraud in banking operations.
5. Create chatbots for faster communication and to improve customer service, particularly for frequently asked questions.
6. Automate part of banking operations with AI to increase speed, accuracy, and productivity.
7. Utilize big data analysis through AI to better understand customers, markets, and competitors, and provide optimal solutions.
8. Establish collaborations with AI-related startups to foster innovation and improve technology in the banking sector.

Authors' Contributions

Authors equally contributed to this article.

Ethical Considerations

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

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Conflict of Interest

The authors report no conflict of interest.

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