Designing and Validating a Behavioral Model of Banking System Customers

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Abstract

The aim of the present study is to design and validate a behavioral model of banking system customers. The research method is a sequential exploratory mixed-methods approach. In the qualitative section, research participants included university professors in fields related to marketing management and business, as well as heads, deputies, and customer relations managers in Bank Day branches in Tehran, totaling 12 individuals selected through purposive (snowball) sampling based on the principle of theoretical saturation. The data collection tool consisted of semi-structured interviews, and the validity and reliability of the tool were evaluated based on the method proposed by Lincoln and Guba. Data analysis was conducted using thematic analysis (Attride-Stirling method) with MAXQDA 2020 software. In the quantitative section, the research method was descriptive-survey, and the statistical population consisted of Bank Day customers in Tehran. Due to the unlimited population, 410 individuals were selected as the statistical sample using Cochran's formula and stratified random sampling. The data collection tool in this section was a researcher-made questionnaire derived from expert opinions in the qualitative section. To assess the validity of the research tool, construct validity was measured using the Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy and Bartlett's test of sphericity, while reliability was assessed using Cronbach's alpha coefficient and composite reliability. Quantitative data were analyzed using descriptive statistics (mean and standard deviation) and inferential statistics with SPSS 22 and SMART PLS 3 software. The results of the qualitative data analysis led to the identification of four overarching themes (banking services, financial affairs, branch characteristics, and human and communication factors) in the form of ten organizing themes (electronic banking, quality and diversity of banking services, foreign exchange and international operations, banking loans and interest payments, investment, internal and external branch design, branch accessibility and welfare facilities, customers, human resources, marketing and advertising) and 66 basic themes. Ultimately, the findings from the quantitative data analysis indicated that the designed model possesses desirable fit and validity.

Keywords: *Banking services, financial affairs, branch characteristics, human and communication factors, customer behavioral models in the banking system.*

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1. Introduction

For several decades, financial institutions have pursued production- and transaction-focused strategies with minimal emphasis on customer relationship management. With the advancement of technology and the development of competitive factors, the need for economic enterprises to establish and maintain effective relationships with customers has become increasingly evident, and banks must gain an accurate understanding of their customers in a competitive market [1]. The goal of identifying customers is to create differentiation, recognize the most valuable customers, and take action to retain and attract them. Thus, customer relationship management is considered an important and influential tool in competition among banks to provide optimal services and attract new customers [2]. Customer relationship management is an infrastructure that reveals and enhances customer value [3]. To have effective customer relationship management, collecting information about customer value and segmenting them to meet the unique needs of each market segment is essential [4].

Today's competitive market is rapidly evolving and characterized by features such as repeat customer purchases over time, a high volume of customers, and valuable information on customer purchasing behavior. In such markets, the goal of customer relationship management is to understand and predict purchasing patterns, identify customer needs, and offer products and services that align with customer desires and expectations. Consequently, customer relationship management is implemented as a prerequisite for marketing activities such as customer segment targeting [5]. Additionally, with the growth of information technology, increased competition among banks, and the provision of services through modern electronic banking, the risk of customer attrition has risen [3].

On the other hand, the influence of environmental and psychological factors such as advertising and the provision of innovative services has caused customer behavior to be unstable under certain conditions, leading banks to face uncertainty in analyzing and predicting customer behavior [1]. Therefore, to better understand customer needs and accurately predict their behavior, it is necessary to examine the dynamic nature of their behavioral patterns.

In today's technological world, there is a vast amount of raw data that, on its own, is of no use. With increasing global competition, companies must use this raw data and information technology to forecast market conditions in the coming months to ensure their survival. This process enables companies to make crucial decisions in their work environment, significantly contributing to their growth [6]. In today's competitive environment, customers are considered the most important asset of any business. Customers and their relationships with organizations constitute a significant part of an organization’s value [7].

Hence, organizations are compelled to establish long-term relationships with their customers to remain competitive. Achieving this goal requires identifying the true value of each customer [8]. However, the dynamic nature of customer behavioral patterns leads to instability in their profitability and the inefficiency of marketing programs [9]. Therefore, organizations need to continuously monitor changes in customer behavior and update their policies accordingly. In the banking industry, analyzing customer behavioral patterns can significantly contribute to higher profitability, precise loan offerings, reduced customer service costs, and similar matters [10].

Bakar and Adzis (2024) identified factors that enhance customer loyalty and provided a strategic model for the banking industry in a qualitative study. The results indicated that the development of banking customer loyalty includes indicators such as bank brand value, respect for customers, service diversity, and amenities provided by banks [11]. Saral et al. (2024) analyzed and modeled service quality factors and their impact on banking customer loyalty, finding that customer participation in banking service policies, service quality, trust-building among customers, online loan applications, and accuracy in financial processes were critical to customer loyalty [12].

Riyath (2024) examined causal factors of customer loyalty in Sri Lankan banks, concluding that timely service delivery, meeting customer expectations, facilitating loan provision, and a culture of respect for customers were crucial to loyalty [13]. Ringo et al. (2023) analyzed factors affecting customer satisfaction and loyalty in financial markets, highlighting that customer loyalty patterns included loans, account control services, banking infrastructure enhancement, respect for customers, a customer-centric culture, and improved human interactions [14].

Maulana et al. (2022) conducted a qualitative study on factors influencing customer loyalty in Islamic banks, identifying performance evaluation management, profit payments to depositors, and deposit profit rates as key dimensions [15]. Kalinin et al. (2020) explored customer financial behavior patterns using social media data, revealing that environmental advertising, network

marketing, and fulfilling loyalty-related promises were critical to developing customer financial behavior patterns [16]. Pourvahidi et al. (2022) found that economic, political, social, and cultural factors, customer personal characteristics, producer behavior, seller behavior, and customer respect influenced customer behavior patterns [17].

Arsenjani (2020) designed a customer behavior model for electronic banking in Iran, showing that cultural backgrounds, interactions between banks and industry players, regulatory interactions, free electronic banking services, customer expectations, and fee structures influenced customer loyalty [18]. Rezvani et al. (2020) designed a customer loyalty model for emerging organizations using artificial neural networks, focusing on eight loyalty factors: trust, service quality, switching costs, reputation, commitment, perceived value, and satisfaction, in eight emerging private banks in Tehran [19]. Mehrabpour (2018) examined the impact of customers' cognitive and emotional evaluations on their variety-seeking behavior in banking, concluding that customer evaluations of banks and their services positively affect service variety-seeking [20].

The present study, due to the importance of examining and identifying key factors affecting banking system customer behavioral patterns, was designed and implemented as a sequential exploratory mixed-methods research. Based on domestic literature highlighting the absence of customer behavioral pattern components and international literature emphasizing the importance of customer behavior evaluation, and considering that no specific model has been designed for Bank Day's customer behavioral patterns, this study aims to contribute significantly to the development and innovation of customer behavioral patterns in the banking system. To analyze customer behavioral patterns, two key areas—customer segmentation and churn management—are considered by businesses, including the statistical population of this study. In summary, after identifying data and variables from available data, customer behavioral patterns will be analyzed, and using qualitative approaches and expert surveys, policies for improving existing conditions and customer relationships will be modeled. Therefore, the main research question is: How can a behavioral model of banking system customers be designed and validated?

2. Methodology

The present study is a sequential exploratory mixed-methods research (qualitative and quantitative). In the qualitative section, the research method was content analysis, and the participants included specialists, experts, and university professors in fields related to marketing management and business, as well as heads, deputies, and customer relations managers in Bank Day branches in Tehran. A purposive non-random sampling method using the snowball technique was employed to select the research sample. The sample size was determined to be 12 individuals based on the principle of theoretical saturation. Data collection in this section was conducted through semi-structured interviews. To ensure the validity and reliability of the research instrument, the method proposed by Lincoln and Guba (credibility, transferability, dependability, and confirmability) was applied. Data analysis was performed using thematic analysis (Attride-Stirling method) with MAXQDA 2020 software.

In the quantitative section, the research method was descriptive-survey, and the statistical population consisted of Bank Day customers in Tehran. Given the unlimited population, the sample size was determined using Cochran's formula, resulting in the selection of 410 participants. Considering the distribution of customers across Tehran, stratified random sampling was employed. The data collection tool in this section was a researcher-made questionnaire derived from expert opinions in the qualitative section. Construct validity was assessed using the Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy and Bartlett's test of sphericity, while reliability was measured using Cronbach's alpha coefficient and composite reliability. Data were analyzed using inferential statistics. Additionally, quantitative data analysis was conducted using descriptive-analytical methods, including descriptive statistics (mean and standard deviation) and inferential statistics with SPSS 22 and SMART PLS 3 software.

3. Findings and Results

Among the 12 interviewees, 10 were men and 2 were women. The majority (66.6%) were aged between 40 and 50 years. Most participants had work experience ranging from 11 to 20 years, with 75% holding a doctoral degree and 25% holding a master's degree.

Data coding was conducted using thematic analysis through the Attride-Stirling method. As shown in Table 1, the resulting codes are categorized into basic themes, organizing themes, and global themes.

Research Question 1: What are the key indicators influencing the behavioral patterns of banking system customers?

Table 1. Key Indicators Influencing the Behavioral Patterns of Banking System Customers

Global Themes	Organizing Themes	Basic Themes
Banking Services	Electronic Banking	Payment Gateway (IPG), VTM ATMs, 24/7 electronic kiosks, QR code scanning and payment, NFC/mobile card readers, rapid replacement and repair of electronic systems, electronic completion of required forms, reduced need for in-person documentation, information security, credit card management systems, online account opening, online loan applications, telephone banking, internet banking (IB and BIB), mobile banking, POS terminals, ATMs
	Quality and Diversity of Services	Providing maximum services at each branch, accuracy in financial processes, timely service delivery, meeting customer expectations, diversifying service delivery tools
Financial Affairs	Foreign Exchange and International Operations	Issuance of foreign exchange guarantees, remittances and other banking transactions, currency trading, development of international operations
	Loans and Interest Payments	Interest payment methods, interest rates on deposits, timely interest payments, loan and credit facility processing, loan repayment methods
	Investment	Establishing economic enterprises, optimizing idle assets, attracting new resources and increasing capital
Branch Characteristics	Interior and Exterior Design	Exterior architecture, interior decoration, branch color schemes, clean and organized interior environment
	Accessibility and Amenities	Adequate teller counters, branch locations based on function, sufficient interior space, dedicated parking, in-branch music, number of branches, queue management systems, upholstered seating, air conditioning, water dispensers
Human and Communication Factors	Customer	Customer education and information, valuing customers, respect for customers, prioritizing customers' time, customer-centric approach, adherence to customer respect
	Human Resources	Employee training, fairness and non-discrimination, respectful behavior, customer guidance and advice, uniformed staff, committed and efficient staff, performance evaluation systems
	Marketing and Advertising	Use of mass media (radio, television, etc.), attractive and unique outdoor advertising, social media marketing, incentive packages for electronic services, positive branding

The proposed model in the present study on customer behavioral patterns in the banking system includes four main (global) themes: banking services, financial affairs, branch characteristics, and human and communication factors. These are further divided into 10 organizing themes, including electronic banking, quality and diversity of banking services, foreign exchange and international operations, loans and interest payments, investment, interior and exterior branch design, accessibility and amenities, customer, human resources, and marketing and advertising, with a total of 66 basic themes identified.

Descriptive statistics of the demographic data in the quantitative section indicated that out of 410 respondents, 264 were men and 146 were women. Educational qualifications included 33 with a high school diploma, 107 with an associate degree, 160 with a bachelor's degree, 93 with a master's degree, and 17 with a doctoral degree. Additionally, 39 respondents were under 30 years old, 121 were aged 31 to 40, 169 were aged 41 to 50, and 81 were over 50 years old. Among the respondents, 125 were single and 285 were married.

Descriptive statistics of the research variables are presented in Table 2.

Table 2. Descriptive Statistics of Research Variables

Variables	Behavioral Patterns of Banking System Customers	Banking Services	Electronic Banking	Quality and Diversity of Services	Financial Affairs	Foreign Exchange and International Operations	Loans and Interest Payments	Investment	Branch Characteristics	Interior and Exterior Design	Accessibility and Amenities	Human and Communication Factors	Customer	Human Resources	Marketing and Advertising
N	410	410	410	410	410	410	410	410	410	410	410	410	410	410	410
Mean	3.86	3.57	3.55	3.52	3.72	3.57	3.54	3.64	3.76	3.56	3.67	3.97	3.69	3.56	3.88

Median	4.00	3.66	3.66	3.66	3.87	3.66	3.40	3.73	4.00	3.50	3.80	4.13	3.77	3.66	3.87
Standard Deviation	0.71	0.66	0.66	0.65	0.66	0.62	0.61	0.66	0.67	0.67	0.67	0.62	0.64	0.63	0.61
Variance	0.50	0.43	0.43	0.42	0.44	0.39	0.37	0.43	0.45	0.45	0.45	0.39	0.42	0.39	0.37
Skewness	-0.88	-0.31	-0.54	-0.55	0.04	0.04	-0.03	-0.03	-0.02	-0.01	-0.01	-0.05	-0.06	-0.04	-0.02
Kurtosis	1.35	0.32	1.03	0.93	-0.91	-0.48	-0.57	-0.54	-0.51	-0.42	-0.65	-0.18	-0.78	-0.42	-0.07
Minimum	1.00	1.00	1.00	1.00	1.73	1.33	1.33	1.40	1.37	1.00	1.40	1.43	1.33	1.30	2.00
Maximum	4.98	4.93	4.86	4.67	4.88	4.86	4.80	4.93	4.88	4.67	4.80	4.97	4.89	4.73	5.00

According to the data in Table 2, the mean scores of all the studied variables, without considering the standard deviation, are approximately strong. To use these variables in the modeling process, a univariate normality test must be conducted. Therefore, the Kolmogorov-Smirnov test was employed, as shown in Table 3.

Table 3. Kolmogorov-Smirnov Test Results for Checking Data Normality

Component	N	K-S Statistic	Significance Level
Behavioral Patterns of Banking System Customers	410	0.587	0.002
Banking Services	410	1.643	0.001
Electronic Banking	410	1.201	0.004
Quality and Diversity of Services	410	0.766	0.002
Financial Affairs	410	1.009	0.011
Foreign Exchange and International Operations	410	1.123	0.013
Loans and Interest Payments	410	0.965	0.021
Investment	410	0.886	0.007
Branch Characteristics	410	0.766	0.001
Interior and Exterior Design	410	0.345	0.001
Accessibility and Amenities	410	1.289	0.002
Human and Communication Factors	410	1.466	0.031
Customer	410	0.634	0.025
Human Resources	410	0.559	0.018
Marketing and Advertising	410	0.637	0.017

According to the data in Table 3, since the significance levels of the components are less than 0.05, the data have a non-normal distribution. Therefore, Smart PLS 3 statistical software can be used.

Table 4. KMO and Bartlett's Test for Questionnaire Data

Index	Value
KMO Index	0.889
Bartlett's Test Value	1452.301
Degrees of Freedom	401
Significance Level (Sig)	0.000

Based on the results in Table 4, the KMO index for the research questionnaire is greater than 0.6, indicating that the sample size (number of respondents) is adequate for performing factor analysis. Additionally, the significance level of the Bartlett test is less than 0.05, which means that the data matrix is not an identity matrix. In other words, there is sufficient correlation among the data for conducting confirmatory factor analysis of the research questionnaires.

Along with construct validity, which is used to examine the importance of selected indicators for measuring constructs, discriminant validity is also considered in this study. This means that the indicators for each construct provide adequate differentiation from other constructs in the model, ensuring that each indicator measures only its intended construct, and that the combination of indicators clearly distinguishes all constructs from one another. Moreover, using the average

variance extracted (AVE) index, it was found that all studied constructs have an AVE above 0.5, as shown in Table 5.

Table 5. Average Variance Extracted Values

Scale (Construct)	AVE	Acceptable Level
Behavioral Patterns of Banking System Customers	0.5366	0.5
Banking Services	0.5124	0.5
Financial Affairs	0.5033	0.5
Branch Characteristics	0.5748	0.5
Human and Communication Factors	0.5963	0.5

Composite reliability was also used to assess reliability, with the results presented in Table 6. Reliability indicates that different respondents interpret the questions consistently. In structural equation modeling, Cronbach's alpha coefficient and composite reliability are used, with values above 0.6 indicating acceptable reliability for each construct.

Table 6. Reliability of Scales Using Composite Reliability

Scale (Construct)	Cronbach's Alpha	Composite Reliability (CR)	Acceptable Level
Behavioral Patterns of Banking System Customers	0.949	0.950	0.6
Banking Services	0.938	0.940	0.6
Financial Affairs	0.845	0.847	0.6
Branch Characteristics	0.943	0.945	0.6
Human and Communication Factors	0.827	0.830	0.6
Overall Reliability	0.858	0.859	0.6

Research Question 2: How is the validation of key factors influencing the behavioral patterns of banking system customers conducted?

After examining and confirming the measurement models in the first step, structural equation modeling was used in the second step to validate the model. The significance of the questions was tested using two indices: the critical value and the significance level. The critical value is obtained by dividing the regression weight estimate by its standard error. Based on a 0.05 significance level, the critical path value must be greater than 1.96 or less than -1.96. Any parameter outside this range is considered insignificant in the model. A significance level below 0.05 indicates that the calculated regression weights differ significantly from zero at a 99% confidence level.

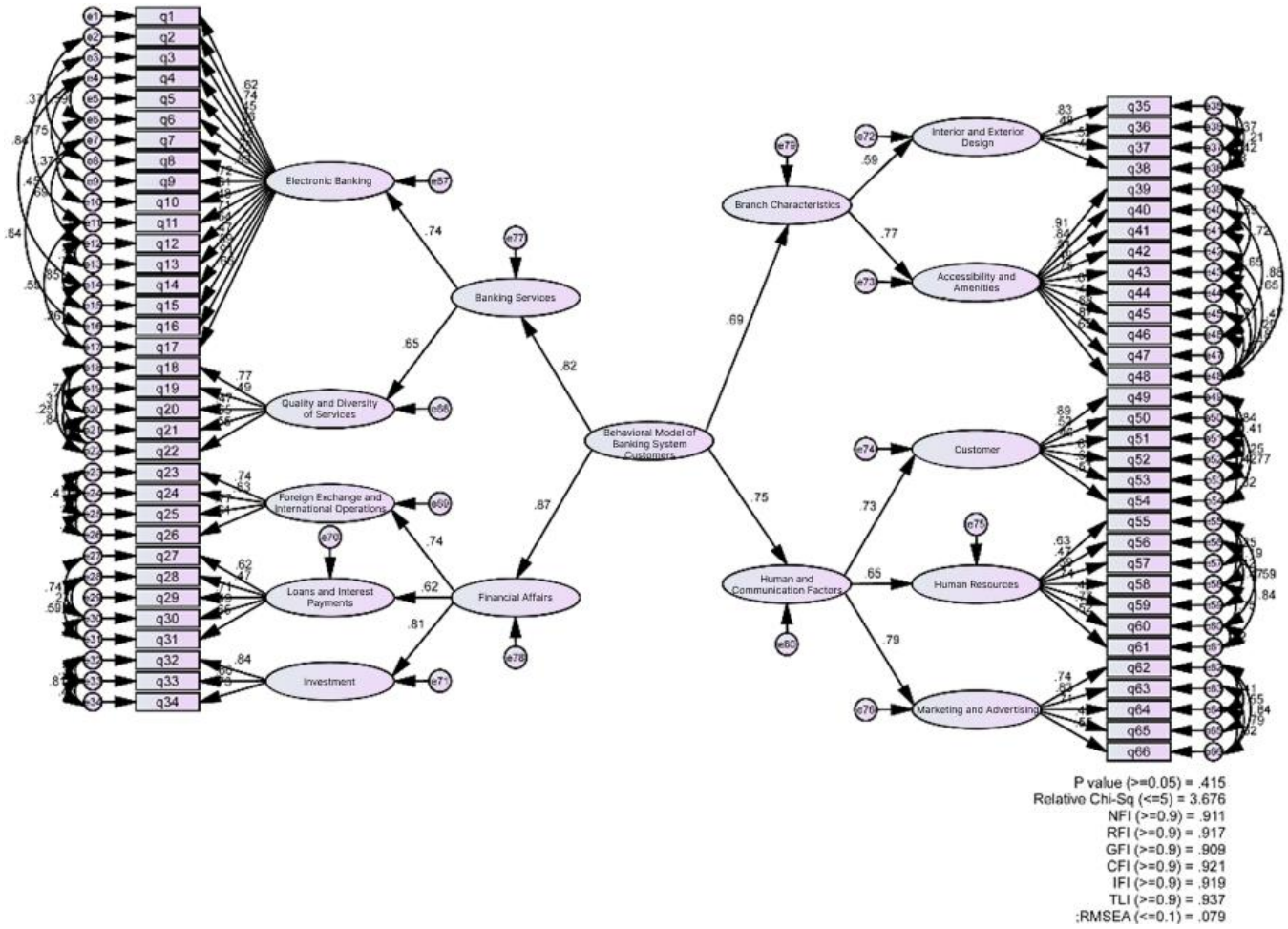

Figure 1. Structural Equation Modeling for Model Validation

As observed, the research model exhibits good fit, with most indices meeting the acceptance level.

Table 7. Fit Indices for the Research Model

Index	P	CMIN/DF	GFI	IFI	TLI	CFI	RMSEA
Research Model	0.415	3.676	0.909	0.919	0.937	0.921	0.079
Acceptable Level	>0.05	<5	>0.90	>0.90	>0.90	>0.90	<0.10
Result	Suitable	Suitable	Suitable	Suitable	Suitable	Suitable	Suitable

Regarding the chi-square value (CMIN) of the model and its significance level, it should be noted that the smaller the chi-square value, the more satisfactory the fit of the researcher's proposed model. If the P value is greater than 0.05, it indicates that the covariance structure of the model does not differ significantly from the observed covariance structure, making the chi-square value acceptable for the model. Given that the P value for most measurement models is greater than 0.05, it can be concluded that the chi-square value is appropriate for the measurement models.

Another fit index is the normalized chi-square (CMIN/DF), which should range between 1 and 5. Since the CMIN/DF values for most measurements fall within this range, it can be concluded that the normalized chi-square value is appropriate for the measurement models. One of the most reliable fit indices is the Goodness-of-Fit Index (GFI), which is comparable to the R^2 value in multiple regression. The closer the GFI is to 1.00, the better the proposed model fits the data. The GFI for the measurement models exceeds 0.90, indicating good data-model fit.

The residual matrix, an important tool for evaluating both overall model fit and partial fit (defined parameters between variables), shows that the root mean square error of approximation (RMSEA) is less than 0.05, indicating low

model error and acceptable fit. The Comparative Fit Index (CFI), another comparative index, is considered acceptable when ranging from 0.90 to 0.95 and excellent when above 0.95. The CFI values for all measurement models exceed 0.90, indicating strong data support for the models. The Tucker-Lewis Index (TLI), also a comparative fit index, is acceptable between 0.90 and 0.95 and excellent above 0.95. The TLI values for all measurement models exceed 0.90, further confirming that the data strongly support the measurement models.

Additionally, the RMSEA, based on the residual matrix, indicates that acceptable models have values of 0.08 or lower, with values above 0.10 suggesting poor fit. The RMSEA values for the measurement models are below 0.08, indicating good model fit.

In conclusion, the measurement models demonstrate good fit and validity. In other words, the overall indices confirm that the data adequately support the estimated models.

4. Discussion and Conclusion

This study aimed to design and validate behavioral patterns of banking system customers. It employed a sequential exploratory mixed-methods approach, using purposive (snowball) sampling for participant selection. Expert interviews were conducted, and thematic analysis was used to identify key themes. Similar and repetitive themes from the interviews related to the research topic were integrated, leading to the identification of four global themes, ten organizing themes, and 66 basic themes influencing the behavioral patterns of banking system customers.

The first identified global theme was attention to banking services. Customer satisfaction and trust in secure payment gateways for online purchases can influence their intention to continue using such services. Enhancing the quality and diversity of banking services in branches plays a significant role in improving competitive conditions for banks. Banks must adapt to the competitive environment by continuously improving their services, including the widespread use of essential banking tools such as online payment gateways, ATMs, and mobile card readers, to strengthen customer interactions with the banking system. Electronic banking, aimed at reducing customer waiting time for banking services, has become a natural strategy for banks to maintain their market share in a fast-paced competitive environment. Accuracy in financial processes and fulfilling promised services on time can positively impact customers' emotional loyalty. These findings align with prior studies [11, 12, 19] which also concluded that building trust through improved service quality, secure banking platforms, and reliable service delivery significantly affects customer loyalty.

Another identified global theme was financial affairs. Customers are willing to deposit their funds with banks in exchange for interest and loans, which provides a competitive advantage for private banks, as they are less constrained by the strict regulations faced by state-owned banks. To foster loyalty among potential customers, banks must review and adjust various financial services to benefit customers, ensuring their satisfaction and loyalty. Fulfilling banking promises, such as timely interest and loan payments, is crucial for customer satisfaction and attitudinal loyalty. Competitive interest rates and strategically located branches are also vital factors, with even amenities like dedicated parking enhancing customer peace of mind. These findings are consistent with prior studies by [15, 16, 20] which found that interest payment methods, interest rates, environmental advertising, network marketing, and loyalty-based service delivery significantly influence customer financial behavior.

The third global theme was the characteristics of Bank Day branches. Private banks have prioritized creating aesthetically pleasing and welcoming environments for customers. A calm and attractive atmosphere, along with well-designed interior and exterior spaces, fosters customer trust and satisfaction. Economic, political, social, and cultural factors, along with individual customer characteristics and respect for clients, influence customer behavior. Well-groomed staff and clean branch environments are also essential for customer loyalty. Access to branch amenities is highly valued by customers. These findings align with prior studies [17, 20] which highlighted that layout, space, signage, queue management, color schemes, and bank imagery significantly impact customer trust and loyalty.

The fourth global theme was human and communication factors. Customer value-centric culture is a critical tool for financial institutions, contributing to customer satisfaction during interactions with the organization. Customers are the most valuable assets of financial institutions, and conveying their importance fosters satisfaction and loyalty. Fulfilling promised services on time, meeting customer expectations, facilitating loan provision, respecting customers, and enhancing human interactions with clients are key factors influencing customer loyalty. Customer-centricity, defined as a behavioral philosophy that identifies and addresses

customer needs effectively, creates a competitive advantage. These findings are supported by prior findings [13, 14, 18] which emphasized that cultural interactions, customer value recognition, appropriate fee structures, and attention to human factors and customer expectations are essential tools for customer loyalty. Respecting customers builds trust, and a customer-centric banking system values its assets, with customer respect being a fundamental principle in modern organizations.

Based on the above findings, the following practical recommendations are proposed for Bank Day branches in Tehran:

(1) Expanding banking services, including in-person and online systems, significantly impacts customer behavior. It is recommended that Bank Day employ specialized advisors in branches to provide tailored consultations, particularly for internet banking services.

(2) Branch management should monitor employee performance, behavior, and customer interactions, addressing complaints and feedback through in-person, phone, and online channels, with timely follow-up provided to customers.

(3) Bank Day managers should simplify the use of electronic banking services to ensure ease of access and usability for customers.

(4) Conveying to customers that Bank Day's services are uniquely designed to meet their needs enhances customer perception, ensuring that banking issues are resolved quickly and securely.

(5) Bank Day branches should adopt a service marketing mix strategy, with specific plans for each element, including effective advertising and brand association to build a cohesive customer community.

Finally, like any study conducted within a specific context, this research has limitations. The primary limitation is the reduced generalizability due to the qualitative approach. This study focused on designing and validating a behavioral model for Bank Day customers, making it challenging to generalize the results to other organizations and contexts. Future researchers are encouraged to conduct similar studies in state-owned banks, providing comparative insights and constructive recommendations.

Authors' Contributions

Authors equally contributed to this article.

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Declaration of Interest

The authors report no conflict of interest.

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Ethical Considerations

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

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