

Designing and Validating an Electronic Customer Relationship Management Model in Private Banks

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Abstract

Purpose: The purpose of this research was primarily to design the electronic customer relationship management model and explain its consequences.

Method: Validation of electronic customer relationship in private banks based on mixed research and descriptive-exploratory method were used. On this basis, with the help of data-based theorizing method, the categories forming the model were identified by open coding, and then with the benefit of central and selective coding, the desired model was presented. Also, in the following, the validation of the model among the studied population was discussed using the method of structural equation modeling. The statistical population for

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presenting the model includes banking industry experts (consisting of senior bank managers with at least 10 years of work experience and academic experts in the field of digital marketing with at least 5 years of experience working in the banking system) and for validating the model two categories of managers and employees of private banks. The research is limited to the city of Tehran and the local customers . The statistical sample of experts up to the stage of theoretical saturation is 16 people using a purposeful judgemental method, and for the model validation stage, 230 people were selected based on the rules of sample size in the structural equation method. The data collection tool included a semi-structured interview for the modeling stage and a questionnaire with a five-point Likert scale for the validation stage.

Findings: The findings showed that 67 basic themes (selective concepts) were categorized and after reviewing, 20 organizing themes (dimensions) were obtained and finally these dimensions were divided into 7 general categories: organizational factors, individual factors, contextual factors, environmental factors, frameworks, strategies, consequences were categorized. The main category identified in this research is "Implementation of E-CRM" and other categories are presented under the headings of causal conditions, background factors, strategies, and consequences.

Conclusion: The results of the calculated value (GOF) for the structural model of the research was calculated as 0.387, which indicates the overall strong performance of the structural equation model of the research. Also, the findings of the quantitative part have confirmed the validity of the structural model of the research and demonstrated the truth of hypotheses of the research (except for hypotheses No. 9, 11, 15, 16, and 17).

Keywords: Electronic Customer Relationship Management, consequences of E-CRM, private banks, data-based theory, partial least squares.

Introduction

With the beginning of the third millennium and at the same time as customers' access to alternative products and services increases, the competitive environment among businesses has faced increasing complexity and business owners use different marketing tools to maintain their customers (Deif, 2019). In the meantime, relationship-oriented marketing, as one of the new marketing approaches, has changed the focus on marketing from transactions to continual relationships with customers. The philosophy of relationship-oriented marketing is based on the fact that regular customers are the most important and valuable asset of an economic enterprise (Bataineh, 2015). Therefore, business owners were gradually driven to create and maintain long-term relationships with customers, especially based on electronic customer communication tools (Hanif & et al, 2020); because experts believe that the primary task of economic enterprises is to create and maintain customers, which the customer relationship management department is responsible for (Butell & Tren Bull, 2018).

Since the basis of forming and strengthening relationships with customers is data and information obtained from customers, the use of electronic tools and the Internet can be of great help in absorbing this information and in the next stages of consolidating these relationships (Herman & et al, 2021). . Social networks and cyber-space provide the possibility of establishing a close relationship between customers and companies, and by personalizing and customizing the type of communication, it greatly helps companies in keeping customers (Zaim & et al, 2020). Research has shown that the use of Internet technology is very effective in the development of electronic relationships with customers and has had far-reaching consequences in various fields (Mang'unyi & et al, 2018). Using the Internet as a channel for business and displaying information provides an opportunity for business development, which has become the basis for providing services to customers in the form of electronic customer relationship management (Nguyen & et al, 2020).

Simultaneously with the growth of information and communication technology, many economic enterprises seek to manage customer relations electronically by using these technologies (Nicoline & Kaplan, 2020). In fact, electronic customer relationship management is a business strategy to gain a long-term competitive advantage through optimizing the time and quality of delivery to the

customer and simultaneously extracting business value based on digital and electronic tools (Khanh & Cao, 2021). Electronic customer relationship management enables companies to establish long-term relationships with profitable customers by knowing their customers, their needs, desires and preferences, as a key to profitability in today's dynamic market (Sota & et al, 2018). Using electronic customer relationship management and taking advantage of its results can help to improve the quality level of the provided services more effectively and, in turn, bring the trust and satisfaction of customers (Kampani & Jhamb, 2020). The goal of electronic customer relationship management is to improve customer service by building a strong relationship with them at the right time (Hendriyani & Auliana, 2018).

In recent years, the banking system, due to the need to establish extensive communication with customer groups, has turned to electronic tools more than any other industry to establish stable communication with customers and provide new banking services. Banks and financial institutions have to make a lot of effort to increase customer satisfaction and loyalty in order to gain more profit share in the market. In the meantime, one of the ways to achieve a greater share of the money market is to create and develop long-term relationships with valuable customers (Kaur & Kaur, 2016). As a result, the managers of the banking system have no choice but to invest in customer relationship management, especially by using electronic communication tools. In order to cope with the unexpected demands of customers, even bank managers are forced to provide services unrelated to their main activity in order to engender more customer satisfaction, because today there are players in the banking sector who can understand the financial needs of customers better and faster, and raise them to higher levels of satisfaction. Therefore, today, adopting customer-oriented strategies that focus on maintaining and improving relationships with customers has become a vital issue for banks (Mang'unyi & et al, 2018).

Evidently, the concept of electronic customer relationship management is one of the issues that has forced banks to rethink the creation of better methods of communication with customers, to try to obtain customer satisfaction by providing services in the context of social networks, websites, etc. Providing bank services to customers can be facilitated by making marketing plans smartly, and that calls for the establishment of a long-term and stable relationship in the

banking industry through electronic tools. On the other hand, it is necessary to pay attention to the consequences of using the electronic customer relationship management system in different fields in order to get a detailed understanding of the output of this system in the banking system.

A glimpse of the previous experimental backgrounds shows that in some researches, the electronic customer relationship management model has been presented. However, the presented models are not compatible with the economic, cultural, social values and norms of the banking system of our country, and there is a need to localize the model for the target society. Also, in the presented models, a clear link between electronic customer relationship management tools and their consequences has not been established. Wordy, although the researches of Herman et al. (2021) and Rashvan et al. (2019) have described some consequences of relationship management with electronic customers, such as improving company performance, developing product innovations, customer satisfaction, and electronic loyalty, however, a comprehensive classification of these consequences has not been provided in the banking system. Therefore, in the current research, in addition to presenting the native model of electronic customer relationship management and explaining its consequences, attempts were made to validate the model in the country's banking system.

Theoretical foundations and research background

Electronic customer relationship management

The experts of the new era believe that survival in the global competitive market requires the rapid growth of the Internet and social networks as a new channel and way to communicate with customers (Guha & et al, 2018). According to the researchers, information and communication technology has laid a special responsibility on different parts of a company, especially the way of interacting with customers, which has caused the emergence of a new concept called electronic customer relationship management (E-CRM) (Kaur & Kaur, 2016).

Electronic customer relationship management means the use of information and communication technologies in order to provide more favorable and value-creating services for economic enterprises during the communication life cycle (Chatterjee & et al, 2020). Electronic

customer relationship management is about attracting and maintaining economically valuable customers through new channels and eliminating those that bring less benefit to the business (Al-Momani & Mohd Noor, 2009). Electronic customer relationship management is a new concept that has been realized from the Internet and web technology, and its focus is on the internet or web-based interaction 2 and 3 (Khanh & Cao, 2021). E-CRM is a combination of hardware, software, process, applications, and management to improve customer service, retain customers and provide analytical capabilities for use in formulating and implementing company strategies (Hendriyani). & Auliana, 2018).

Electronic customer relationship management actually seeks to integrate customer information (Kampani & Jhamb, 2020). At the same time, the electronic customer relationship management strategy cannot be imitated, because the resources necessary to implement electronic customer relationship management in a company not only include tangible hardwares and softwares, but also a number of intangible factors such as human resources, processes, and organizational culture (Kim & et al, 2010). Also, paying attention to and handling of human resources and the capabilities that must be assimilated through the implementation process of electronic customer relationship management are necessary for the successful implementation of the system (Nguyen & et al, 2020; Chen & et al, 2020).

According to the researchers, relationship management with electronic customers has different characteristics, the most important of which are as follows: a part of CRM, CRM improver, technology facilitator, use of electronic channels, and business context. electronics, online marketing, multi-channel communication, personalization, intelligent search engineering, data mining, interactive dialogue, electronic forums, online shopping, and... (Sivaraks & et al, 2011). Therefore, the current research aims to present the native model of electronic customer relationship management and explain its consequences, validation of the model in the country's banking system has also been attempted to answer the following question:

1. How is the design and validation of the proposed model of electronic customer relationship management in private banks in Tehran?

Electronic customer relationship management models

Various models of electronic customer relationship management have been presented, especially in foreign research articles, each of which has emphasized some indicators and components in the proposed model. For example, Herman and et al. (2021) refer to indicators such as the existence of an online customer database, the ability to identify important customers from the obtained data, the ability to provide effective individual services based on the obtained data, the ability to create online interactions suitable with customers. Dehghanpouri and et al. (2020), mention persuading and encouraging customers to share problems when they arise, reviewing customer needs and responding individually, the organization benefiting from appropriate technical personnel to provide technical support for the use of computer technology in building relationships with customers, the organization's use of appropriate software to provide services to customers, and reviewing and responding to customer complaints at a high speed are considered to be the characteristics of an effective electronic customer relationship management.

Al-Damour and et al. (2019), claim that proper organization of interactive processes with customers in the ECRM system, proper control in communication between sales channels, creation of personalized marketing support processes, determination of after-sales service processes, integration of various information sources customer, providing useful customer information through ECRM systems, ECRM system support in scoring customer information segmentation, estimating customers' purchasing power through ECRM system, supporting the organization in investing in ECRM infrastructure, implementing the proper development of the ECRM system, the integration of the ECRM system and the old MIS system, the support of the open network system of sales forces, etc. have been considered as the most important components of ECRM. Goha and et al. (2018) also use online communities, social media support, obtaining and using information, customer relationship-oriented, social data, customer communication, engagement (strengthening, simultaneous development, influence, equipping), dynamic marketing capabilities/market orientation, and IT infrastructure capability and consider them as components of ECRM effectiveness. Kaur and Kaur (2016) also considered the consequences of ECRM to include reducing operating costs, improving customer responsiveness,

innovation in banking services, reducing the complexity of products and services, and appropriate use of marketing and strategic tools.

Research gap and research innovation

The review of the experimental backgrounds shows that in previous research, the model of electronic customer relationship management has been presented and each of the presented models points to the categories of electronic customer relationship management in the technological, organizational, environmental, and human fields, which are based on the type. There are some differences between businesses or industries. In some of these backgrounds, some factors affecting the effectiveness of electronic customer relationship management have been discussed. For example, Khan and Cao (2021) showed that customer orientation, knowledge and technology management, data quality, and CRM strategy were influencing factors in the success of E-CRM. Dehghanpuri and et al. (2020) also showed that trust, service quality, and customer satisfaction affected the success of E-CRM systems. Cherapanokorn (2019) showed in a study that organizational orientation, customer orientation, knowledge orientation, and information technology orientation have influenced the success of E-CRM in the hotel industry.

The second group also discussed some of the consequences of using the E-CRM system. Herman et al. (2021) showed in a study that E-CRM capabilities have an impact on the development of product innovations through the capacity to share customer information. Nikolin and Kaplan (2020) also showed that ECRM features in the pre-purchase stage (store website features, product variety), and ECRM features in the post-purchase stage (problem - solving, order tracking, service after the sale) have had effect on customer satisfaction and the pre-purchase stage on customer loyalty. Hanif et al. (2020) also showed that E-CRM has a positive relationship with organizational success, Because since it increases competition, It necessarily leads the organization in the path of maintaining E-CRM systems. Al-Damour and et al. (2019) investigated the effects of ECRM success factors on business performance in Jordanian commercial banks. The findings of the research showed that ECRM factors directly affected the three constructs of customer trust, customer retention, and customer satisfaction. Kaur and Kaur (2016) also conducted a study entitled "Effects of E-CRM competitive

advantages on E-CRM performance in Indian banking industry". Abu-Shanab and Anaghreh (2015) showed that by using E-CRM, it is possible to provide quality and understandable information in two languages, the possibility of easy transfer (movement) of data, the quality of service to the consumer, correct implementation of customer requests, integrated marketing channels, online communities through social media, providing rewards and benefits to customers, personalizing services for customers, and payment site security, which in turn improve the quality of customer service in The banking sector is effective.

The summary of the researchers shows that in some studies, the model of electronic customer relationship management has been presented, however, the models presented in the banking system of the country and based on the economic, cultural conditions, values and social norms of our country have not been localized. On the other hand, the presented models have not identified and validated a clear relationship between electronic customer relationship management and its consequences in the banking system. Therefore, in order to fill the existing research gap, it is necessary to design a native model of electronic customer relationship management and explain its consequences, as well as validate it in the country's banking industry.

Methodology

The purpose of this research was primarily to design an electronic customer relationship management model and explain its consequences in the banking system, and then, to validate it based on field data in private banks in Tehran. Therefore, the present research is applied in terms of its purpose and descriptive - exploratory type in terms of the research implementation strategy. Also, in terms of the data collection method, this research has been conducted in two forms: library and field studies (semi-structured interview tools and questionnaires). In terms of the type of data, the current research is mixed (qualitative-quantitative). The statistical population for the stage of presenting the model includes experts in the banking industry and senior managers of banks with at least 10 years of work experience in the banking industry and academic scholars and professors related to the field of marketing, with at least 5 years of experience working with the banking industry and conducting research activities in this industry. Sampling was done with a

purposeful judgmental approach and snowball method until the theoretical saturation of the data and 16 people (6 university professors and 10 senior managers of the banking system) were selected and participated in the interview process. Also, the statistical population for the model validation stage includes two categories. The first group includes managers and employees of private banks in Tehran. According to the preliminary estimate concerning the administrative department of the central branch of each bank, the number of managers of these branches is 468 and the number of employees is 1897 (2365 in total). The second category includes the customers of these banks who use electronic banking services (this statistical population is unlimited). The sample size for both mentioned categories was calculated by the method of determining the sample size in the structural equation modeling method (if the data is normal, 5 people are considered for each question), 230 people. Questionnaires were distributed by stratified random method among managers (46 people) and employees (184 people). Also, customer questionnaires were randomly distributed among 230 people, and data was collected.

This research has been done in two general parts. In the first part, with the methodology of data-based theorizing, the model of communication management with electronic customers and the explanation of its consequences in the banking system were discussed. In this regard, at first, the themes and categories related to electronic customer relationship management and its consequences based on the open coding method were identified, and then, using the axial coding based on the paradigm model and selective coding, the relationship management model with the electronic customer and its consequences in the banking system were designed and judicial cases were counted. Also, in the second part of the research, the validation of the structural model calculated in the previous part was done and the relationships between the categories of the model based on the structural equation modeling method (SEM) were tested in the private banks of Tehran.

To ensure the validity of the interview results, the acceptability and confirmability criteria were used based on the method of reviewing the expressions uttered by the participants in the interview. Also, the retest method has been used to calculate the reliability of the interview. In this regard, among the conducted interviews, three selected interviews were coded by the researchers twice in a 14-day

interval, and the reliability rate of the test was calculated as 88%, which indicates that the coding of the interview terms in two different periods were 88% similar. Also, in order to validate the calculated structural model, a 46-question questionnaire with a five-point Likert scale based on the indicators of the calculated model from the qualitative part was prepared and distributed among the statistical sample. In general, the structural model of the research consists of nine reflective measurement models. The reliability of reflective measurement models in Smart-PLS software is evaluated based on two indicators or criteria, reliability of observable variables (reliability of reagents) and composite reliability, the results of which are presented in Table (1).

Table (1) Reliability test of reflective measurement models of the research

The main variable	CR index	Dimensions	factor load	statistics T
Organizational factors	0.768	Technology features	0.753	914/14
		Organizational resources	0.788	906/21
Individual factors	0.793	Characteristics of managers	0.615	060/8
		Staff characteristics	0.790	995/21
Organizational Culture	0.821	Customer-oriented culture	0.728	271/14
		Networking with customers	0.781	001/21
		Explanation of customer-oriented values and norms	0.813	258/24
Organizational Structure	0.822	Organizational flexibility and agility	0.788	173/20
		Development of communication channels	0.787	894/24
		Systems integration	0.755	091/22
		Organization size	0.753	442/19
Organizational goals and strategies	0.837	Vertical alignment of technology strategies with the organization	0.741	268/18
		Horizontal alignment of technology strategies with other organizational units	0.656	147/14
		organizational goals	0.734	875/18
Implementation of E-CRM	0.845	Organization of E-CRM	0.590	380/7
		Customer understanding and differentiation	0.669	814/11
		Customer attraction and	0.752	907/16

The main variable	CR index	Dimensions	factor load	statistics T
		retention		
		Developing customer relationships	0.755	927/18
Environmental factors	0.719	internal environment	0.655	628/12
		The external environment	0.530	667/6
iCustomer implications	0.787	Customer trust	0.762	133/22
		Commitment and customer participation	0.703	117/14
		Customer satisfaction and loyalty	0.716	294/17
		Intention to buy	0.753	914/14
Functional consequences	0.808	Product/service development and acceleration of its delivery	0.788	906/21
		Brand development	0.615	060/8
		Improvement of sales	0.790	995/21
		creativity and innovation	0.728	271/14
		reduction in costs	0.781	001/21

Since the absolute values of factor loadings in table (1) are more than 0.4 and the values of T statistic are above 1.96, therefore the reliability of the indicators has been confirmed. Also, the index values (CR) of the variables were obtained above 0.7, indicating that the composite reliability was also confirmed. Also, the validity of the reflective measurement model in Smart-PLS software was checked in two ways; Convergent validity (internal) and diagnostic validity (divergent or external) have been evaluated. In this research, the diagnostic validity test at the construct level or the Fornell-Larker criterion has been used.

Table (2) Convergent and diagnostic validity test of reflective measurement models

Local variables	Research	Organizational factors	Individual factors	Organizational Culture	Organizational Structure	goals and strategy	Implementation of E-CRM	Environmental factors	Customer implications	Functional consequences
Organizational factors	AVE=0/624 VAVE=0/789									
Individual factors	0/468	AVE=0/658 VAVE=0/81								
Organizational Culture	0/450	0/468	AVE=0/604 VAVE=0/777							
Organizational Structure	0/542	0/502	0/640	AVE=0/538 VAVE=0/732						
Goals and strategies	0/473	0/400	0/648	0/681	AVE=0/631 VAVE=0/794					
Implementation of E-CRM	0/593	0/433	0/648	0/638	0/614	AVE=0/577 VAVE=0/759				
Environmental factors	0/513	0/435	0/393	0/482	0/475	0/510	AVE=0/560 VAVE=0/748			
Customer implications	0/509	0/633	0/486	0/527	0/476	0/524	0/535	AVE=0/583 VAVE=0/763		
Functional consequences	0/649	0/571	0/546	0/560	0/611	0/629	0/567	0/661	AVE=0/559 VAVE=0/747	

Since the values calculated for the AVE index in The table (2) for each of the research variables are higher than 0.5, it can be said that each of the research variable is well explained by their observable variables and as a result of convergent validity of the models, the reflective measurement of the research has been approved of. Also, since the values of the root mean square (\sqrt{AVE}) for each hidden variable is higher than the correlation of that variable with other hidden reflective variables in the model, so the diagnostic validity of each of the reflective measurement models has been confirmed. In the following, the research findings are analyzed.

The findings of the database theorizing method and model presentation

After collecting the data and summarizing the conducted interviews, It was attempted to make the relevant theory emerge by using the data-based theorizing method and based on three stages of open, central , and selective coding. In the following, the three steps of the data-based theorizing method have been explained and represented.

Step 1) Open coding: Based on the findings of this section, 161 selective codes (selective expressions) were identified. In the next step, by examining and analyzing selective expressions, they were categorized into 67 basic themes (selective concepts). In the following, these basic themes were reviewed again in terms of content and appearance, and they were categorized into 20 organizing themes (dimensions). Finally, by analyzing the organizing themes again , these dimensions were categorized in the form of 7 general categories (overarching themes). The results of open coding are presented in Table (3):

Table (3) open coding of interview results

Overarching themes	Organizing themes	Basic themes
Organizational factors	Technology features	Ease of access and use
		Electronic learning capabilities
		Perceived benefits of technology
		Technology experience
	Organizational resources	Funds
		Information Resources
		Technology-oriented human resources

Overarching themes	Organizing themes	Basic themes	
		Logistics resources	
Individual factors	Characteristics of managers	Attitude of managers	
		Innovation of managers	
		Managers support	
		Resourceful leadership	
	Staff characteristics	Manpower skills	
		Employee commitment and participation	
		Mental norms of employees	
		Employee technology experience	
Implementation of E-CRM	organize E-CRM	Creating hardware infrastructure	
		Development of software skills	
		Explanation of jobs and responsibilities	
		Providing a system of feedback and suggestions	
	Customer understanding and differentiation	Identifying customer needs	
		Categorizing customers based on needs	
	Customer attraction and retention	Attracting customers based on marketing methods	
		Customer retention based on stimulus packages	
	Developing customer relationships	Establishing stable relationships with customers	
		Receiving customer feedback and suggestions continuously	
	bed makers E-CRM	Organizational Culture	Customer-oriented culture
			Networking with customers
Explanation of customer-oriented values and norms			
Organizational Structure		Organizational flexibility and agility	
		Development of communication channels	
		Systems integration	
Organizational goals and strategy		Organization size	
		Vertical alignment of technology strategies with the organization	
		Horizontal alignment of technology strategies with other organizational units	
		organizational goals	
Environmental		internal environment	Competitive pressure

Overarching themes	Organizing themes	Basic themes
factors		The power of the customer
		Industry pressure
		Investor support
	The external environment	Government support
		International interactions
		Foreign partners
Promotion strategies of E-CRM	knowledge management E-CRM	Creating or acquiring knowledge
		Application of knowledge
		Knowledge sharing
	Structural agility	flexibility
		Response speed
		Interactive communication
	Promotion of technology culture	Desire to use superior technology
		The value of technological knowledge
		Adherence to the use of efficient technology
	Improving skills and professional training	Professional development
		Development of technological skills
		Development of technological policies
	Promotion of social capital	Commitment and participation
		the trust
		networking
Consequences of E-CRM	Customer implications	Customer trust
		Commitment and customer participation
		Customer satisfaction and loyalty
		Intention to buy
	Functional consequences	Product/service development and acceleration of its delivery
		Brand development
		Improving sales
		creativity and innovation
		reduction in costs

The Second step) Axial coding: The goal of this stage is to establish the relationship between the dimensions (categories) produced in the open coding stage. This work was done based on the paradigm model. The main category identified in this research is "Implementation of E-CRM" and other categories are presented under the headings of causal conditions, background factors, strategies, and consequences.

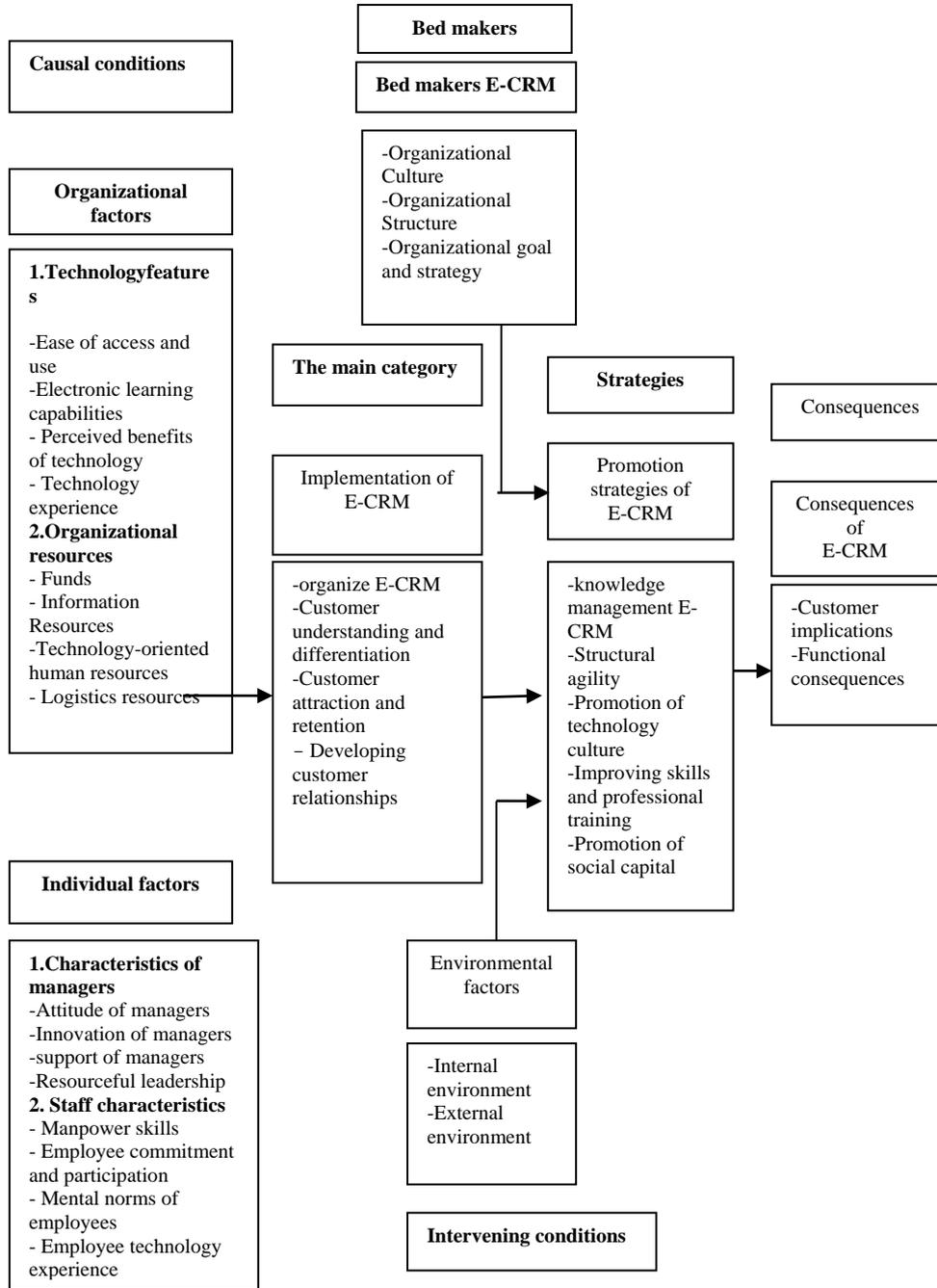


Figure (1) E-CRM paradigm model in the country's banking industry

The third step) Selective coding: In this study, the electronic customer relationship management model and the explanation of its consequences in the banking system were investigated and clarified. In the study of this phenomenon, new categories were noticed, based on which the coding tables were adjusted; Then, in the phase of core coding based on the paradigm model and with the category "Implementation of E-CRM" as the main category, the categories were further developed and a relationship was established between them and the core category. Finally, this section resulted in the presentation of verdict theorems between the variables of the model and the final selected model of the research was presented.

Theoretical Propositions show the general relationships between the central class and other classes, in a way that will eventually lead to the final result. Theorems include relationships and conceptual structure that include 19 theorems as follows:

Proposition 1. Organizational factors (technological features and organizational resources) as the causal conditions affecting the organizational culture are the basis for the implementation of E-CRM in the banking system.

Proposition 2. Organizational factors (technological features and organizational resources) are the causal conditions affecting the organizational structure of the E-CRM implementation in the banking system.

Proposition 3. Organizational factors (technological features and organizational resources) as causal conditions influencing organizational goals and strategy are the basis for the implementation of E-CRM in the banking system.

Proposition 4. Individual factors (characteristics of managers and employees) as causal conditions affecting the organizational culture are the basis for the implementation of E-CRM in the banking system.

Proposition 5. Individual factors (characteristics of managers and employees) are the causal conditions influencing the organizational structure of the E-CRM implementation in the banking system.

Proposition 6. Individual factors (characteristics of managers and employees) as causal conditions affecting organizational goals and strategies are the basis for the implementation of E-CRM in the banking system.

Proposition 7. Organizational culture is a foundation for the successful implementation of E-CRM in the banking system.

Proposition 8. The organizational structure serves as a foundation for the successful implementation of E-CRM in the banking system.

Proposition 9. Organizational goals and strategy serve as a foundation for the successful implementation of E-CRM in the banking system.

Proposition 10. Organizational factors (technology features and organizational resources) are the causal conditions influencing the implementation of E-CRM in the banking system.

Proposition 11. Individual factors (characteristics of managers and employees) are the causal conditions influencing the implementation of E-CRM in the banking system.

Proposition 12. The implementation of E-CRM in the banking system leads to positive consequences in the field of customers.

Proposition 13. The implementation of E-CRM in the banking system leads to positive consequences in the functional field of the organization.

Proposition 14. The creation of positive consequences in the field of customers due to the implementation of E-CRM in the banking system leads to the creation of positive consequences in the functional field of the organization.

Proposition 15. Environmental factors (internal and external) play a moderating role in the relationship between organizational culture as a platform for the successful implementation of E-CRM in the banking system.

Proposition 16. Environmental factors (internal and external) play a moderating role in the relationship between the organizational structure as a foundation for the successful implementation of E-CRM in the banking system.

Proposition 17. Environmental factors (internal and external) play a moderating role in the relationship between goals and organizational strategy as a foundation for the successful implementation of E-CRM in the banking system.

Proposition 18. E-CRM platforms play a mediating role in the relationship between organizational factors and the successful implementation of E-CRM in the banking system.

Proposition 19. E-CRM platforms play a mediating role in the relationship between individual factors and the successful implementation of E-CRM in the banking system.

In the following, an attempt has been made to present these ruling theorems in the form of research hypotheses and to test the research hypotheses by using the structural equation modeling method, while validating the model.

Findings of a structural equation modeling

After presenting the electronic customer relationship management model and explaining its consequences in the banking system based on the data-based theorizing method, in the second part of the research, the validation of the model based on the structural equation modeling method and using the five-point Likert scale questionnaire among the private banks of Tehran was discussed. . In this regard, the structural model related to research hypotheses was designed using Smart-PLS software, and based on beta coefficients and multivariate regression equations, the relationships between the tested variables were measured. In figures (2) and (3), the output of the structural model related to beta coefficients of the path and significant numbers between each of the variables of the research are displayed.

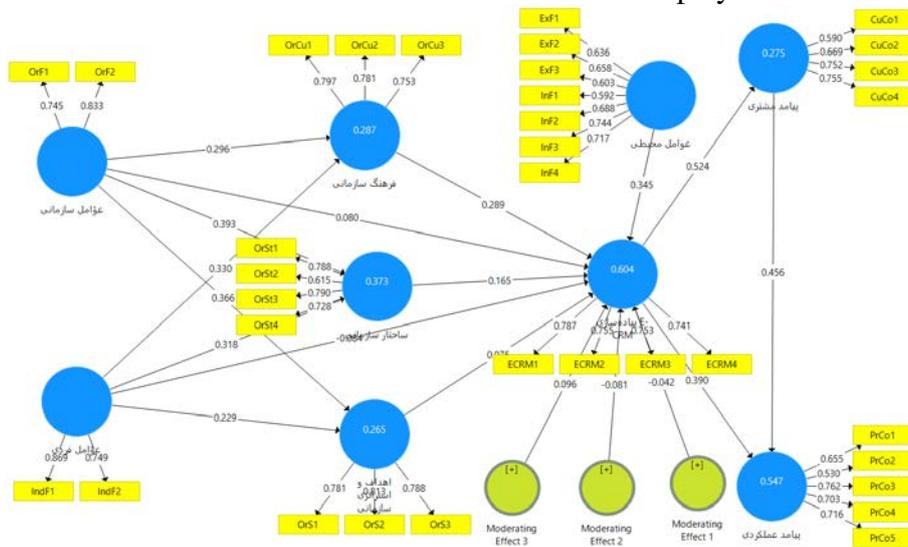


Figure (2) Beta coefficients diagram of the path of the structural model of the research

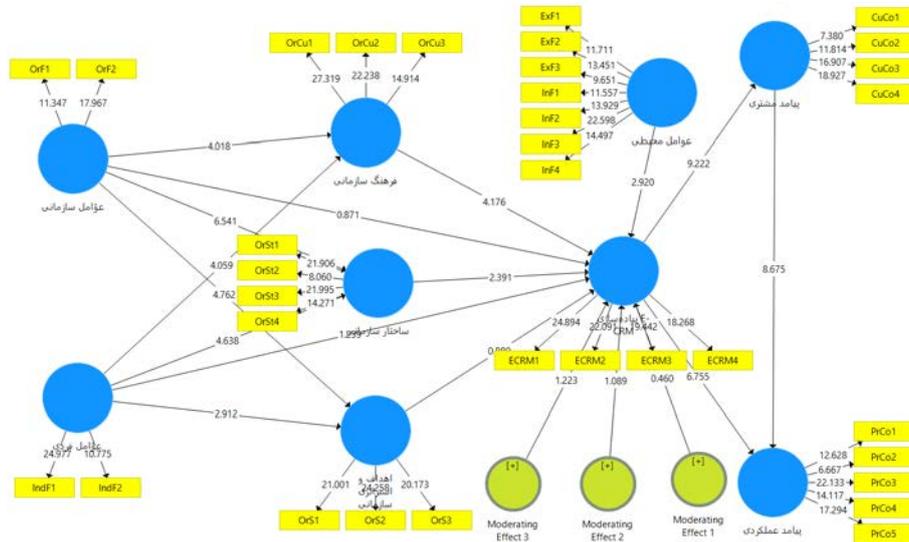


Figure (3) Chart of significant numbers of the structural model of the research

Also, the values related to the coefficient of determination index (R^2), predictive correlation index (Q^2) or redundancy index, and goodness of fit index (GOF) are presented in table (4).

Table (4) evaluation indicators of the structural model of the research

Local variables	Index (R^2)	Index (Q^2)	Index (GOF)
Organizational Culture	0.287	0.160	---
Organizational Structure	0.373	0.183	---
Organizational goals and strategies	0.265	0.156	---
Implementation of E-CRM	0.604	0.305	---
Customer implications	0.275	0.120	---
Functional consequences	0.547	0.237	0.387

The results of table (4) show that the coefficient of determination (R^2) related to the endogenous variables of the research model is acceptable and more than 60% of the changes in the central variable "E-CRM implementation" are explained by its input variables. At the same time, the positive values calculated for the redundancy index of endogenous variables (Q^2) in the above table show that the structural model has the necessary quality to predict the endogenous variable of the research. Also, the calculated value (GOF) for the structural model

of the research was calculated as 0.387, which indicates the overall strong performance of the structural equation model of the research. In the following, according to the beta coefficients of the path between the endogenous and exogenous variables in the structural model of the research and the significant values that have been obtained for the research hypotheses separately, each hypothesis has been examined in the table (5).

Table (5) beta coefficients and significant values related to research hypotheses

Row	Hypotheses	Beta coefficient	A significant amount	The results of the hypotheses
1	organizational factors <--- organizational culture (direct effect)	0.296	112/4	It was approved of
2	Organizational factors <--- Organizational structure (direct effect)	0.393	669/6	It was approved of
3	Organizational factors <--- Organizational goals and strategy (direct effect)	0.366	731/4	It was approved of
4	Individual factors <--- organizational culture (direct effect)	0.330	948/3	It was approved of
5	Individual factors <--- organizational structure (direct effect)	0.318	722/4	It was approved of
6	Individual factors <--- organizational goals and strategy (direct effect)	0.229	965/2	It was approved of
7	Organizational culture <--- E-CRM implementation (direct effect)	0.297	759/3	It was approved of
8	Organizational structure <--- E-CRM implementation (direct effect)	0.182	503/2	It was approved of
9	Objectives and organizational strategy <--- E-CRM implementation (direct effect)	0.162	851/1	Was rejected
10	Organizational factors <--- E-CRM implementation (direct effect)	0.282	094/4	It was approved of
11	Individual factors <--- E-CRM	0.006	0.094	Was rejected

Row	Hypotheses	Beta coefficient	A significant amount	The results of the hypotheses
	implementation (direct effect)			
12	E-CRM Implementation <--- Customer Consequences (Direct Effect)	0.524	168/9	It was approved of
13	E-CRM implementation <--- functional consequences (direct effect)	0.390	839/6	It was approved of
14	Customer consequences <--- functional consequences (direct effect)	0.456	928/8	It was approved of
15	Organizational culture <--- E-CRM implementation (moderating effect of environmental factors)	0/042	0.460	Was rejected
16	Organizational structure <--- E-CRM implementation (moderating effect of environmental factors)	0/081	089/1	Was rejected
17	Organizational goals and strategies <--- Implementation of E-CRM (moderating effect of environmental factors)	0.096	223/1	Was rejected
18	Organizational factors <--- E-CRM platforms <--- E-CRM implementation (indirect effect)	0.073	179/2	It was approved of
19	Individual factors <--- E-CRM platforms <--- E-CRM implementation (indirect effect)	0.064	183/2	It was approved of

In general, the findings related to the test of the research hypotheses in table (5) according to the regression coefficient obtained in the relationship between the variables and the significant value which is more than 1.96 show that all the research hypotheses (except the hypotheses no. 9, 11, 15, 16, and 17) have been confirmed.

Discussion and conclusion

This research has followed the electronic customer relationship management model and the explanation of its consequences in the banking system as well as its validation in private banks in Tehran. In this regard and considering the research gap that existed in this field in

the country an attempt was made to create a theory on that score using the data-based theorizing method. Therefore, by using the mentioned method and based on three stages of open, central and selective coding, the native model of electronic customer relationship management along with its consequences in the country's banking industry was presented and finally 19 theoretical theorems were created. Also, in the second part of the research, the validation of judgment cases calculated by selective coding was done and the relationships between the variables were tested, and finally, 6 relationships (hypotheses no. 9, 11, 15, 16, and 17) were not confirmed and the rest of them were equal. They were confirmed by the results in the table (5). Figure (2) shows the final validated model after the structural equation modeling test in private banks in Tehran.

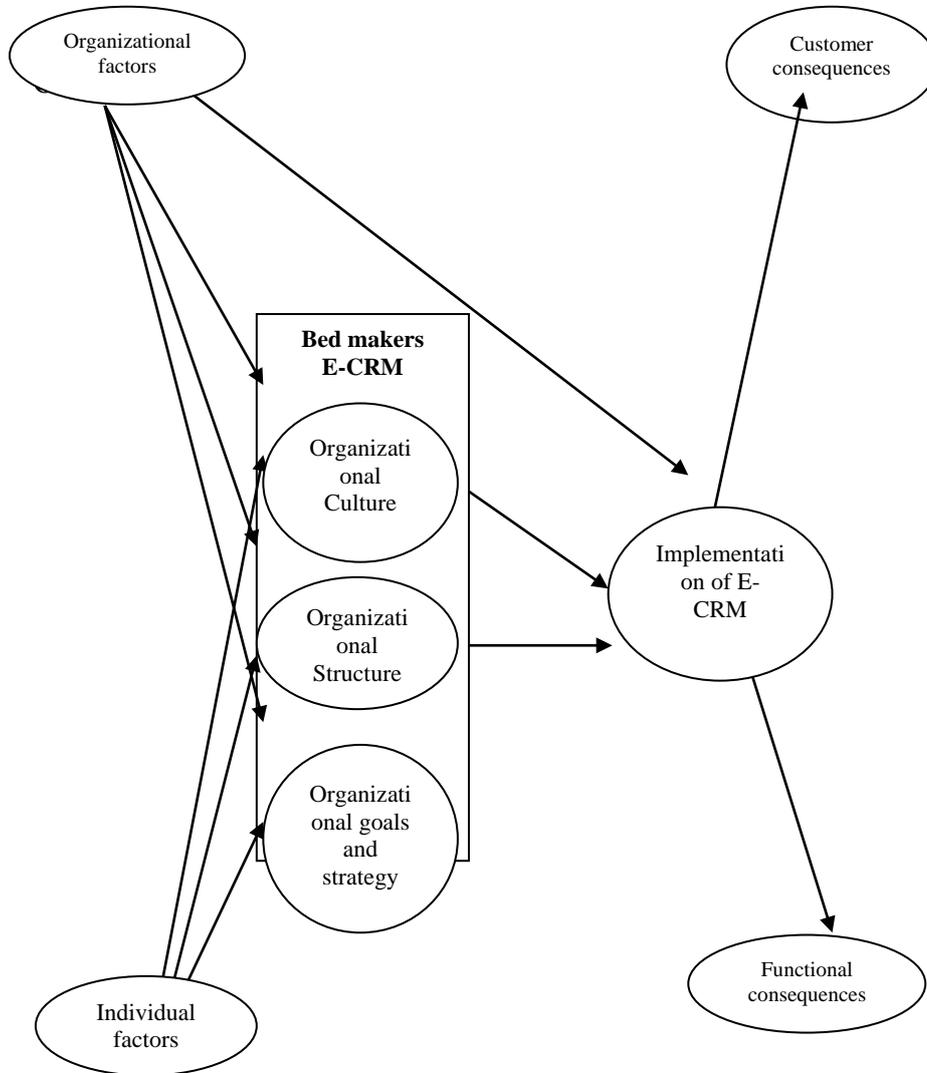


Figure (2) The final confirmed model of electronic customer relationship management and its consequences in private banks in Tehran

Based on the results of the research, the confirmed causal conditions affecting the management of communication with electronic customers include two general categories; organizational and individual factors, the category of "organizational factors" holds such things as; Features of technology and organizational resources. In the meantime, the characteristics the technology are focused on criteria

such as ease of access and use, electronic learning capabilities, perceived benefits of technology, and technology experience. Organizational resources also include financial resources, information resources, technology-based human resources, and logistics resources. Also, the category of "individual factors" comprises indicators such as; Characteristics of managers and employees. Meanwhile, the characteristics of managers include such things as attitude of managers, innovation of managers, support of managers, and facilitator leadership. The characteristics of employees are also focused on indicators such as human resources skills, commitment and participation of employees, mental norms of employees, and technology experience of employees. Investigations show that some of these causal conditions have been mentioned in some researches. For example, Dehghanpuri and et al. (2020), emphasized the benefit of the organization from suitable technical personnel to provide technical support for the use of computer technology in building relationships with customers and the benefit of the organization from appropriate software to provide services to customers. Al-Damour and et al. (2019) have considered the integration of various sources of customer information and providing useful customer information through ECRM systems which is effective in setting up this system. Ahmed and Rashid (2012) considered infrastructure to be an important factor in electronic customer relationship management. Rachella and Hu (2008) also pointed out the current technical skills of employees, allocation of financial resources, top management support, customer knowledge management and company size.

According to the results, the dimensions and components of the implementation of electronic customer relationship management in the banking system include four general areas; Organized E-CRM, customer understanding and segmentation, customer acquisition and retention, and customer relationship development. At the same time, the category of "E-CRM organization" includes indicators such as; Creating hardware infrastructure, developing software skills, explaining jobs and responsibilities, and providing a feedback and suggestions system. Also, the category of "customer understanding and differentiation" includes indicators such as; Customer needs have been identified and customer categories have been based on needs. The category of "customer attraction and retention" also includes criteria such as customer attraction based on marketing methods and

customer retention based on incentive packages. Finally, the category of "developing relationships with customers" includes creating stable relationships with customers and receiving feedback and suggestions from customers continuously. In this regard, Nikolin and Kaplan (2020) also explained the features of ECRM in the pre-purchase stage (store website features, product variety), and the features of ECRM in the post-purchase stage (problem - solving, follow-up orders, after-sales service), and the pre-purchase stage. Aldmor and et al. (2019), support the organization to invest in ECRM infrastructure, proper implementation of the ECRM system, integration of the ECRM system and the old MIS system, and support for the open network system of the sales force as the executive steps of implementing this system. Ip and et al. (2006) described the steps of ECRM implementation including three steps: customer segmentation (customer purchase intention analysis, customer classification, customer behavior analysis, group segmentation, personalized configuration), process (marketing, sales), and service), and customer support (customer decision support, monitoring and customer self-service).

Based on the results, the confirmed platforms that are effective in managing communication with electronic customers in the banking system include two categories; Organizational culture is an organizational structure and the category of organizational goals and strategies was not confirmed. The category of "organizational culture" includes indicators such as; Customer-oriented culture, networking with customers, and explaining customer-oriented values and norms. Also, the category of "organizational structure" consists of indicators such as; Organizational flexibility and agility, development of communication channels, systems integration, and organizational size. On the other hand, the moderating effect of effective contextual factors in the management of communication with electronic customers in the banking system, which was considered in two areas of internal and external environmental factors in the model, was not confirmed in the validation test. Similar research also emphasizes some of the proven ground-breakers in the model. For example, Khan and et al. (2021) have pointed out in their research that factors such as data quality and CRM strategy have an indirect effect on the success of E-CRM and are the basis for the development of the customer relationship management system. Dehghanpuri and et al. (2020)

determined that trust directly affects customer satisfaction and the success of E-CRM systems, in the meantime, both service quality structures and customer satisfaction are the basis for the development of electronic customer communication services provided. Hanif and et al. (2020) also explained the effects of E-CRM on organizational performance with the mediating role of customer satisfaction.

Based on the results, the consequences of managing communication with electronic customers in the banking system fall into two general categories; Customer outcomes and functional outcomes. At the same time, the results made it clear that the category of "customer consequences" contains indicators such as; Customer trust, customer commitment and participation, customer satisfaction and loyalty, and purchase intention. Also, the category of "functional consequences" holds indicators such as; Product/service development and acceleration of its presentation, brand development, sales improvement, creativity and innovation, and cost reduction. In their research, Herman and et al. (2021) have mentioned the company's performance and the development of product innovations as consequences of electronic customer relationship management. Rashvan and et al. (2019) have also investigated the effects of ECRM on electronic loyalty in the banking industry.

However, summarizing the results of the quantitative section also shows that some hypotheses were not confirmed and their findings are not compatible with past researches. For example, in this research, the effect of organizational goals and strategies on the successful implementation of E-CRM in the banking system has not been confirmed, which seems to be due to the type of goals and organizational strategies adopted in the studied private banks. The effect of individual factors on the successful implementation of E-CRM in the banking system was not confirmed either, which is caused by the difference in the abilities and characteristics of managers and employees of the studied community and other organizations investigated in previous research.

Also, the moderating effect of environmental factors in the relationship between the platforms of electronic customer relationship management (culture, structure, goal and strategy) and the successful implementation of E-CRM in the banking system were not confirmed, which is due to the differences existing between the environmental factors of this research and other previous studies.

According to the statistical results, the most effective strategies for improving electronic customer relationship management in the banking system are five including the implementation of knowledge management related to customer communication services, structural agility, promotion of technology culture, promotion of skill and professional training, and promotion of social capital, and they have been proposed for the implementation of E-CRM in private banks:

1. One of the causal conditions affecting the electronic customer relationship management process in the banking system is organizational factors. In this regard, it is suggested that the managers of the studied bank should create technology features in the electronic customer relationship management system, including ease of access and use of the system, electronic learning capabilities, explaining the perceived benefits of technology, and developing technology experience. Also, it is urgent to take necessary measures in order to provide organizational resources for the development of this system in the banking system in different dimensions, financial, informational, technology-oriented manpower, equipment and logistic.

2. Another causal condition affecting the electronic customer relationship management process in the banking system is the development of individual factors including the characteristics and capabilities of managers and employees. In this regard, it is suggested that the managers of the studied bank should take the necessary action regarding the development of managers in their attitudinal dimensions, as attitude of managers, innovation of managers, support of managers, and facilitator leadership. Also, for the development of the characteristics of employees, it is necessary to improve the skills of human resources, the commitment and participation of employees, the development of mental norms of employees, and the increase of technological experience of employees.

3. In order to implement electronic customer relationship management in the banking system, it is necessary to organize this system. For this, it is necessary to establish hardware infrastructure, develop software skills, clarify jobs and responsibilities, and provide a system of feedback and suggestions. It is also necessary to take proper action in relation to customer understanding and differentiation, to identify customer needs and categorize customers based on needs. Concerning customer absorption and retention, customer absorption based on marketing methods and customer retention based on

incentive packages should be done. Regarding the development of relations with customers, stable relations with customers should be created and feedback and suggestions from customers should continually be received.

4. One of the effective platforms for the electronic customer relationship management process in the banking system is the creation of a supportive organizational culture. In this regard, it is suggested that the managers of the studied bank should create a culture of customer orientation, and network with customers, and should explain the values and norms of customer orientation in the banking system.

5. One of the platforms influencing the electronic customer relationship management process in the banking system is the creation of a supporting organizational structure. In this regard, it is suggested that the managers of the studied bank should take measures to create organizational flexibility and agility, develop communication channels, integrate systems, and consider the size of the organization in the banking system.

6. One of the strategies to improve electronic customer relationship management in the banking system is the implementation of a knowledge management system related to electronic customer relationship management. In this regard, it is suggested that the managers of the studied bank should create an electronic knowledge management cycle in the organization based on knowledge creation or acquisition, knowledge application, and knowledge sharing. Also, in order to improve the agility strategy, it is necessary to take urgent measures to increase the flexibility, speed of response, and interactive communication in the organization. In order to develop a technology culture promotion strategy, it is necessary to take appropriate action to increase the desire to use superior technology among customers and employees, the value of technology knowledge, and adherence to the use of efficient technology. In order to improve professional skills and training, it is essential to take appropriate action on professional development, technological skills development, and technology policy development. Finally, in order to enhance social capital, it is of great account to take necessary measures with a view to promoting the commitment and participation of customers, increasing their trust level, and creating networking.

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