How Implementation of E-CRM May Enhance an Organization's Internal and External Success

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A R T I C L E   I N F O

A B S T R A C T

Due to recent advancements in information technology and communication, Electronic Customer Relationship Management has drawn the attention of many firms to achieve competitive advantages. Despite the increasing importance given to understanding their customers better, organizations find inconsistencies between information technology and the existing marketing strategies, when they come to decide upon implementing e-CRM, as well as lack of theoretical backgrounds for developing success measures in this domain. Therefore, this study deals with describing a model for successful e-CRM, using variables such as customer information quality, technology system, efficiency, customer satisfaction, and profitability. These constructs cover most of variables and concepts presented yet in theories of successful information systems and views about customer satisfaction. Ample empirical evidence is gained through this research from analyzing the outcomes of 309 questionnaires distributed to employees and customers of some automobile manufacturers having established e-CRM. The results of this study may open up new ways of applying concepts and relationship-oriented marketing models and e-CRM in automobile industry.

1. Introduction

Modern world has witnessed so much continuous changes over recent decades that distinguish it from all past eras. Consequences and impacts of "new communication society" based on advanced technologies, have affected human life in a way that necessitates deploying new techniques and methods. More than any other domain, marketing has been affected by modern world changes, so that over the past two decades, marketing views have changed in businesses as well as service organizations of public sector. For instance, it has gone through a gradual evolution from designing 4P (Product, Price, Place, Promotion) to building relationships and communication networks.

With increasing development and evolvement of marketing concept, new techniques have emerged in this field. One of these techniques which have been the focus of many marketing theorists and researchers over recent decades is Customer Relationship Management, and more recently Electronic Customer Relationship Management (e-CRM). Need for building

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and maintaining strong and long-term relationships with customers, lower cost of retaining existing customers compared to attracting new customers, and finally the need for focusing on key customers as the most essential source of profitability, has forced organizations to invest heavily on customer relationship systems [1]. Now, thus, the main issue confronting organizations is the need to maintain a high level of consistent and optimal relationship with their customers and to meet their wants and needs at a timely manner. Thus, successful and functional deployment of relationship-oriented systems plays substantial role in total success of organizations.

The initial part of the current study is devoted to examining theoretical backgrounds of e-CRM and its success model. Next, research hypotheses are stated and analyzed, and finally, some suggestions have been offered.

2. Theoretical backgrounds and Literature
2.1. Customer Relationship Management

Customer Relationship Management or CRM is a business approach based on relationship-oriented marketing, and is deployed as a tool for it. CRM can be considered as an integrated approach of defining, maintaining and creating a network for customer relationship and continuous enhancement of this network to achieve mutual advantages(for both buyers and sellers) via personalized and interactive contacts, with value-added during a long time period [2]. Pan et al. [3], state that "CRM will bring up the next management revolution by upgrading and developing relationship-oriented marketing tools". They assert that "although it seems to be a simple and clear notion, there has been a diversity of views about what CRM actually is". To some theorists, CRM means integrating marketing, sales and service by segregating IT-based business processes, that maximizes interaction value with each customer. To some others, CRM is only a result of relationship-oriented marketing that emphasizes gaining higher profits from the customers [3].

By the way, as mentioned by practitioners, four important principles should be taken into account about CRM [4]:
- Customers should be viewed as valuable properties.
- Customers' profitability is different and not all customers are favorable.
- Customers have different needs, preferences, purchase behaviors, and price sensitivities.
- Companies may make their products more compatible by learning their customers' needs and interests.

Figure1 lists the major views of CRM practitioners in describing CRM dimensions.

Optimizing tools for revenue and profit by combining different parts [5].

Collecting, saving and analyzing behavioral information for attracting and retaining customers [6].

The process of acquiring and retaining the selected customers and interacting with them [7].

Adopting information technologies for integrating activities and segregating business processes [3].

Figure1- major views on describing CRM concept

2.2.Electronic Customer Relationship Management (e-CRM)

By emergence and dominance of electronic space, vast opportunities are provided for a more proper and intimate relationship with customers, and a new method of relationship with customers, called e-CRM, has been shaped. E-CRM is a combination of software, hardware, processes, applications and managerial commitments for a more favorable relationship with customers. In fact, e-CRM is an interdisciplinary field, composed of CRM and e-business. Unlike CRM which aims at serving key customers, e-CRM enjoys an internet-based search structure that considers a congruent application for managing all markets, advertising projects, sales, service and support operations on the internet. From the application side, e-CRM has been created for managing internet interactions of electronic businesses, so it deals with interactive and web-based contacts [5].

E-CRM tools can help sales representatives and marketing managers in identifying needs and demands of customers. Today, some businesses have adopted technologies that transfer customer information to sales agents. This information is provided for sales agents' preparation before contacting customers. Diverse software collect data related to products, sales and customer information, from one or several sources. Besides, a series of information about the product is sent to the customer, via web, e-mail or cell phone. This way, by offering information before his/her request, s/he will be switched from a high-involvement buyer to a low-involvement one [8].

Besides influencing buying involvement, e-CRM can also help in preparing brief profiles of customers and identifying their required products. Traditionally, the profiles were demographic or behavioristic. Demographic profile may consist of the individuals' residence, marital status, number of children, their favorite newspapers or magazines, etc. Behavioristic profiles focus on the time customer spends for searching on the website or his/her clicks there; actually they focus on action proceedings of the customer. E-CRM adds a sort of smartness to these profiles and assists the company in offering customized products. E-CRM tools are also helpful in cutting the costs of the company. Traditionally, a website was judged by the number of page visits, and many businesses set their goal based on page numbers visited at a specified time [5, 9]. However, only 2 percent of website visitors really buy the product. Hence, companies must spend plenty of time to ensue why the rest did not buy. Every company can create a special positioning among its customers by applying e-CRM, for increasing electronic sales and decreasing the lost sales [8].

E-CRM can be useful in launching new product or service lines. Adding new products is necessary to step ahead of competitors and meet customers' hidden or newly revealed wants. By using e-CRM, we can identify what products or services our customers want, and which of them will be successful. Before developing, adding or redefining the new product line, the manager must first identify the customers. E-CRM, undoubtedly, can be adopted as one of the best decision-making systems for offering new products, due to its capabilities.

E-CRM, like any other IT innovation, is not only technological. It is one of the vastest innovations that organizations employ as a customer-oriented business strategy, and includes redesigning activities and reengineering processes [7]. Thus, two applications of e-CRM can be identified: Operational e-CRM and Analytical e-CRM. Operational e-CRM relates to customers' contact-points, which consists of inside-the-company contacts (phone, mails), and outside-the-company contacts (selling to customer, email promotions). Hence, customers' contact-point may include website, emails, phone, direct selling, fax, etc. Analytical e-CRM entails a technology for processing a vast amount of customer data. The main objective of this part of e-CRM is to identify customers by analyzing demographic elements, purchase patterns, and other factors to create new business opportunities.

2.2.1.   e-CRM Success Factors Model

Roh et al. [10], examined the effects of implementing e-CRM on internal and external organizational success that forms the basis of hypotheses and evaluation of e-CRM system success in the current study. Dimensions and elements of the model are reviewed in figure2 and table1.
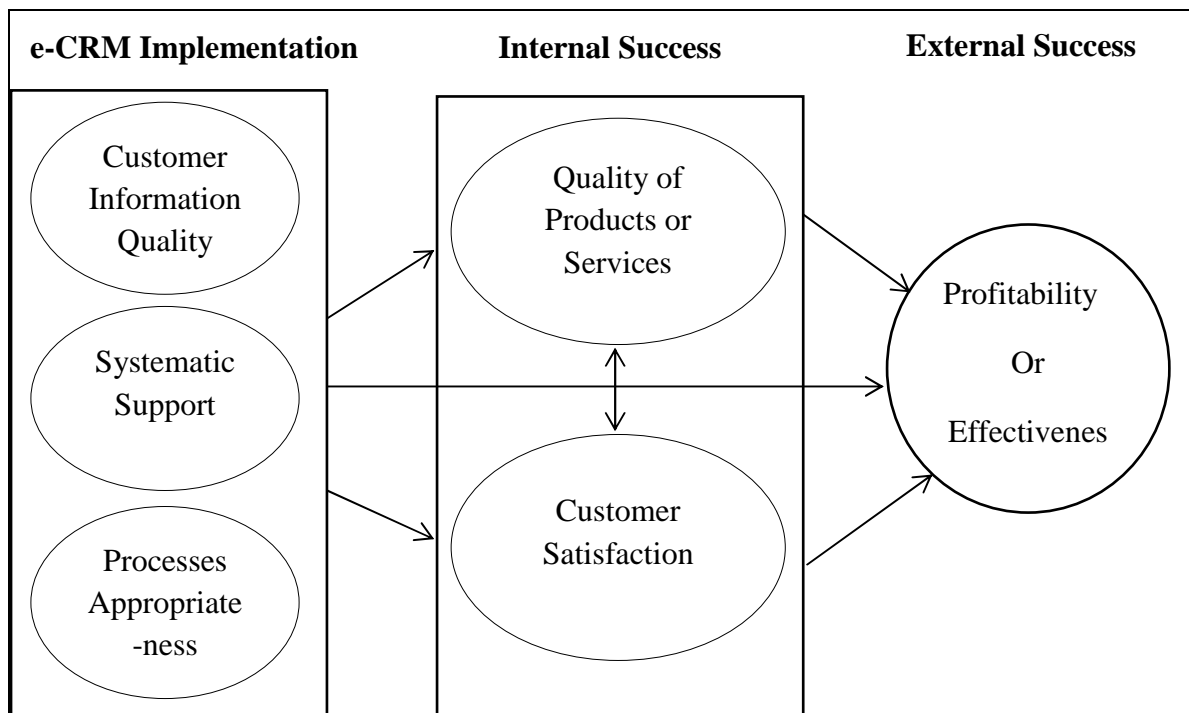

Figure2. Success Factors Model of e-CRM system extracted from [10]

2.2.1.1.Implementation of e-CRM system

According to [11], influencing factors of implementation impact on system launch. These two researchers identified 3 dimensions for a proper implementation of a system: process appropriateness, customer information quality and technology system. These factors are used in the current study with some modifications in marginal elements.

Customer Information Quality: part of the value created by e-CRM system attributes to system users. Thus, customer perceived performance is very essential for evaluating success of the system [12]. Till now, several traits are introduced for measuring information quality. In a research, traits such as honesty, applicability, output timeliness, reliability, completeness, awareness and relatedness of the processed information are examined [4]. Delone and McLean [11], emphasized the link between high quality of customer information and e-CRM success and asserted that a great deal of the link between quality and success is intuitive. Here, the following elements are used to evaluate customer information quality: Database Management System (DBMS), information effectiveness, proper classification of information and predicting customer needs.

e-CRM Technology System: One of internal evaluation criteria of e-CRM system is its technology system. The determinant criterion in evaluation of technology system is the functional specifications of the system under study [13, 14]. Practitioners and authors have described these specifications in this way: resources exploitation, reliability, response time and user-friendliness of information website [15]; data accuracy, reliability, comprehensiveness, system flexibility and user-friendliness [16]; continual user contact, documentation quality and even ability to save program code [17].

Combining the above-mentioned elements, this study aims at embedding for CRM, helping to execute appropriate system of customer relationship, and capability of creating a universal communication network as elements of technology system.

e-CRM process appropriateness: Process appropriateness is part of the discussion of technological proportion which is a set of processes and technologies that can be applied in the system. Combining the views of different researchers and modifying them according to the related industry (Automobile Companies), this study applies four criteria, type of communicating with customer in the system, capability of linking different geographical regions, service personalization, and problem-solving tracking, as the criteria of process appropriateness.

2.2.1.2.e-CRM Internal Success

e-CRM processes efficiency: e-CRM implementation success is mainly evaluated according to achieving the predefined goals which includes multifunctional parameters such as time, cost and functionality. Efficiency is an important and useful measure of functionality which is different from productivity, despite some commonalities. Unlike productivity, technical efficiency is seldom examined by researchers [17, 18]. When the purpose of investment is enhancing operational efficiency, many traditional evaluation techniques may be considered.

Some of these investments create some sort of visible fiscal advantages that can be contrasted to direct costs of the project. This sort of operational implementations, traditionally, exploit the investment's efficiency advantages. However, many managers pay attention to a vaster strategy; i.e., creating a proper and responsive IT infrastructure. Yet, it remains a question how to assess, describe, and homogenize the investment results [19, 20].

In this study, IS success factors are different from the traditional ones, and cover comprehensive access to e-CRM process inside the company. We assess internal efficiency of e-CRM as one of the internal success factors of e-CRM in the form of decreasing the costs and response time, and use efficiency as representative of internal success of e-CRM system. In other words, higher levels of internal efficiency mean higher levels of e-CRM system.

Table1- criteria items in success factors and organizational success measures

Construct	Factors	Selected items
	Customer Information Quality	Creating a Database Management System(DBMS) Information effectiveness Proper classification of information Predicting the customer needs
	Technology System	Grounding for CRM Help in implementing a proper system of communicating with customers Capability of creating a universal communication network
Internal Success Factors	Efficiency	Facilitating the communications Cutting costs Decreasing response time
	Customer Satisfaction	Intimate interaction with customers Positive image of the company Decreasing the customer complaint Customer overall satisfaction
External Success Factors	Profitability	Improving service quality Increasing offered services Customer's tendency to repeat purchase

Customer satisfaction and e-CRM: satisfaction is the result of overall perceptions, evaluations and psychological reactions to consuming a product or service [19, 21]. In marketing studies, customer satisfaction is focused on products and physical or virtual services that the company delivers to its customers through direct or indirect distribution channels [22]. We evaluate satisfaction on the basis of these factors: intimate interaction with customers, positive image of the company, customers' complaints and overall satisfaction of customers.

2.2.1.3.External Success of e-CRM

The final criteria of e-CRM success are profitability. Logically, e-CRM equals net advantages of its application [18]. The notion of measuring e-CRM outputs is of great importance,

because of increased expenditures on electronic systems' equipment and service activities [23]. Operational measures of profitability are improving service quality, increasing the amount of offered services and tendency of customer to repeat purchase.

2.3.Literature Review

Since e-CRM is among the new techniques of marketing, vast research has not been carried out on the field, special in Iran, and most of the researches are merely in the field of relationship-oriented marketing and CRM. However, due of generalizability of concepts and models of CRM to e-CRM, the findings of some past studies can be referred to. The researches results represent that deployment of CRM tools can impact on satisfaction of key customers of banks [24]. Schullin et al. [8], assert that e-CRM not only has changed the traditional paradigm of marketing, but also has resulted in the increase of communications' efficiency and effectiveness. In another research, critical success factors of CRM are examined in the case of e-government in which a set of factors are identified and classified into three general frameworks of relationship tools, relationship incentives and value generation for customer [3]. In spite of these relevant researches, the principal model of the current study is designed based on Roh et al. [10], study and it should be noted that this study was broadly influenced by the results of Delone & McLean study [11]. Pan et al. [3], have evaluated the prerequisites of CRM realization by organizational internal and external success, but in the current study, because of special properties of the population and surveying some specialists and masters of the field, two major modifications were made to the above model: Firstly, instead of systematic support variable, e-CRM technology system is applied that enjoys measurement capability and a stronger theoretical background. Secondly, in evaluating the internal variables, efficiency is deployed instead of quality; that can evaluate different dimensions of overall success of organization better than quality from the point of profitability.

Research Methodology
Research Hypotheses
Hypothesis I:
There is a relationship between e-CRM implementation and organization's internal and external success.
Hypothesis II:
Customer information quality, e-CRM technology system and appropriateness of e-CRM processes play the most significant roles in the organizational success, from the point of view of customers, sequentially.
Hypothesis III:
Customer information quality, e-CRM technology system and appropriateness of e-CRM processes play the most significant roles in the organizational success, from the point of view of employees, sequentially.

Research settings (time, place, theme)
Research settings of theme, time and place are defined as follows:

Time setting: this research is carried out in the time period of January 2008 to September 2008. The secondary data is also collected in a four-year period of 2002 to 2006.

Place setting: because of geographical dispersion of automobile industry activities in the country, and meanwhile centrality of decision-making and strategic importance of companies based in Tehran, the research is carried out in Tehran.

Theme setting: In this study, by describing the success model of implementing e-CRM, the relevance of variables like customer information quality, e-CRM technology system, efficiency, customer satisfaction and profitability are assessed as research hypotheses.

Research method

This research is of survey type, since it aims at describing the conditions required for implementation of CRM, and examines the position and current conditions of e-CRM in automobile industry, without any subjective conclusion and intervention. The research type is that of field study and library research. One of the major sources of data collection is questionnaire, consisting of 65 questions, which assess the research hypotheses.

Cronbach's Alpha is applied to ensure the reliability of evaluation tools. Using SPSS, the questionnaire's Alpha yielded 0.8403 which means it is reliable enough.

Statistical population consists of the companies' employees in different departments; including Communication and IT, Sales& Marketing, After-sales Services, and Research Centers, as well as their customers. Stratified random sampling approach is used to select the samples, in which the first step was to divide members of the population into homogeneous subgroups, then random sampling was applied within each stratum. Generally, the research was conducted on a sample size of 309 people, which approximately two-third (197) of them were selected from among the customers, due to the importance of customers' views in evaluation of e-CRM implementation success.

Data Analysis and Hypotheses Testing

Three hypotheses are proposed for this study, which describe interrelationships of e-CRM parameters in the statistical population. After collecting the questionnaire data, two methods were applied to analyze them:

Descriptive method: In this method, a general description of the following items is provided: qualitative concepts dispersion in the population; i.e., age, gender and education level.

Analytical and Inductive method: After scoring questionnaires and calculating descriptive indicators (indices) for testing hypotheses and generalizing the results to the population, Kolmogorov Smirnov, correlation coefficient and Friedman tests will be applied.

Demographic Data Analysis

As shown in table2, majority of respondents (almost 64%) are males. The same number of male employees can be seen in automobile manufactures. Analysis of the questionnaires' results represents that females have a more positive attitude towards e-CRM implementation and variables' interrelationship than males.

Table2- Sample dispersion of gender, age and education level

Gender dispersion			
Females		Males	
Frequency	Percentage	Frequency	Percentage
113	36.6	196	63.4

Age dispersion							
Under 25		25 to 35		35 to 45		Above 45	
Frequency	Percentage	Frequency	Percentage	Frequency	Percentage	Frequency	Percentage
38	12.3	144	46.6	69	22.3	58	18.8

Education level dispersion							
Diploma & lower		Technician		Bachelor's		Master's and higher	
Frequency	Percentage	Frequency	Percentage	Frequency	Percentage	Frequency	Percentage
47	15.2	71	23.0	136	44.0	55	17.8

From the point of age dispersion, the least number of respondents belongs to those under 25 years old, most of whom were among the customers. Most of the respondents belong to age group of 25-35 which accounts for 46.6 % of the sample size.

From the point of education level, the least number of respondents have diploma or lower degrees, while most of the respondents hold Bachelor's. This is because of the companies' policy recruiting engineers and expertise for communication, information, sales, and marketing departments.

Testing hypotheses

Reliability or internal compatibility implicates the precision of marginal elements of assessment tools in measuring the same concept [25]. In this study, reliability is assessed by Cronbach's Alpha in which all marginal measures were above the acceptable level of 0.7 [26, 27]. However, Cronbach's Alpha varied from 0.734 for efficiency to 0.902 for e-CRM technology system.

Table3 presents the averages and standard deviations of e-CRM implementation factors and organization's internal and external successes, along with marginal variables of each. In the current study, these values yield the same results as similar past studies, the only difference being standard deviations which is lower [10, 11].

Table3- Averages and standard deviations of the variables

	Average	Standard deviation
e-CRM Implementation Factors	3.29	0.43
Customer Information Quality	3.38	0.45
e-CRM Technology System	3.57	0.51
Processes Appropriateness	2.98	0.37
Internal Successes	3.93	0.60
Efficiency	4.09	0.63
Customer Satisfaction	3.74	0.55
Profitability	4.21	0.61

To test the normality of scores obtained from factors, Kolmogorov Smirnov test is applied. Results are presented in Table4. As the table shows, all factors have the Sig. above 0.05, except for customer information quality. Thus, distribution of factors can be considered as normal and parametric tests can be used to examine the variables' interrelationship, as we will use Correlation Coefficient Test to test the variables' interrelationships.

Table4- Results of Kolmogorov Smirnov test

	e-CRM Implementation Factors	Customer Information Quality	e-CRM Technology System	Processes Appropriateness	Internal Successes	Efficiency	Customer Satisfaction	Profitability
Sig.	0.86	0.045	0.099	0.144	0.194	0.214	0.165	0.177

Correlation between e-CRM Implementation Factors and Organization's Internal and External Success is shown in Table3. The first hypothesis of this research indicates a relationship between e-CRM Implementation Factors and Organization's Internal and External Success, that as is shown in Table4, this relationship is accepted at level of 0.01(r=0.514). Such a relationship can be seen between e-CRM Implementation Elements and Internal and External Success Indices. The tensity of this relationship is higher between Internal Success and e-CRM Implementation(r=0.365). As predicted, there is a positive relationship between e-CRM Implementation Factors and Efficiency, Customer Satisfaction and Profitability, just e-CRM Technology System did not show any correlation with efficiency and profitability.

Table4- Correlation Coefficients of Variables

		e-CRM Implementation Factors	Customer Information Quality	Technology System	Processes Appropriateness
Organization's Success	Overall	0.514**	0.433**	0.304**	0.394**
Internal Success		0.365**	0.336**	0.304**	0.394**
Efficiency		0.265**	0.223**	0.137	0.216*
Customer Satisfaction		0.303**	0.242**	0.249**	0.345**
Profitability		0.324**	0.433**	0.163	0.438**

Note: ** at error level of 0.01, * at error level of 0.05

To expand research results, Hierarchical Regression Test is used to analyze causal relationships of the variables. Thus, tertiary dimensions of e-CRM Implementation are inserted into the equation as predictor variables and Success as outcome variable, which regression results are presented in Table 5. As the table shows, two variables of Customer Information Quality and Processes Appropriateness have causal relationship with Organization's Overall Success, at error level of 0.01.

Table5- Regression Test of e-CRM Implementation and Organization's Overall Success variables

Model	Non-standard Coefficients	Standardized Coefficients	t	Error value
	B	Beta		
1. (fixed value)	2.276		11.353	0.000
e-CRM processes appropriateness	0.331	0.438	5.641	0.000
2. (fixed value)	2.225		8.266	0.000
e-CRM processes appropriateness	0.241	0.320	4.011	0.000
Customer Information Quality	0.225	0.312	3.916	0.000

To test the second and third hypotheses, Friedman Non-parametric Test is used to rank variables. According to hypothesis II, customer information quality, e-CRM technology system and e-CRM processes appropriateness, sequentially, had the greatest role in organization success, from the customers' point of view. Results of Friedman Test approve this hypothesis, relatively. As Table 6 shows, from customers' point of view, three factors of customer information technology, e-CRM processes appropriates and e-CRM technology system, sequentially, play the greatest roles in organizational success; Thus, e-CRM processes should be replaced with e-CRM technology system, in the sequence of hypothesis II priorities.

Table 6- Friedman Test results of hypothesis II, from customers' point of view

e-CRM Implementation Factors	Ranking's Average	Rank
Customer Information Quality	2.13	1
e-CRM Processes Appropriateness	2.04	2
Technology System	1.97	3

In the third hypothesis, ranking of Customer Information Quality, e-CRM Processes Appropriateness and Technology System are predicted for the employees' point of view, on the basis of implementation factors' importance in organizational success. The table also shows that views of customers and employees are almost similar about relative importance of any of e-CRM implementation factors in organizational success.

Table 7- Friedman Test results of hypothesis III, from employees' point of view

e-CRM Implementation Factors	Ranking's Average	Rank
Customer Information Quality	2.43	1
e-CRM Processes Appropriateness	2.36	2
Technology System	2.09	3

3. Conclusions and Suggestions

This study aimed to explain the Success Model of e-CRM in automobile Manufacturers. Due to the newness of e-CRM concept in marketing domain, different views are expressed in this respect, one of the most known of success models, which has also been applied in Assurance Industry of South Korea and U.S.A., is assessed and hypotheses are adjusted according to the industry under study. According to the results obtained from the analysis of the first hypothesis, the relationship between implementation and organizational successes are approved. In other words, e-CRM implementation will promise increased efficiency, customer satisfaction and finally organization's profitability.

The amazing point in this study was that relationship between e-CRM technology system and organizational success proved to be less strong than other e-CRM implementation factors. Results of this hypothesis may help to explain why some large investments on modern IT technologies lead to failure. Because this study proved that large investment on technological dimensions will not necessarily lead to efficiency enhancement and profitability. Another notable point in this study is the attitudes of many respondents about e-CRM systems, which are so useful in finding reasons for weakness and ineffectiveness of such systems as time passes; As, many respondents believed that "in spite of passing some years after the establishment of CRM and e-CRM in automobile industry, that received public's vast and increasing welcome, their phone lines and operators have not increased proportionate to the increased contacts. Moreover, call centers had a more favorable state of response timing. Thus, we recommend that when e-CRM systems is established, offered services should be adjusted to communications volume, periodically.

Among the main challenges of the respondents, were personalizing offered services according to needs of each caller. Many believed that special programs should be included for every group of users. For example, many people are not aware of functions and services of phone call centers, so they do not call in case of need. Offering more services, like special consultancy to customers via phone call centers and websites can be covered by e-CRM systems, too. The system can also provide suitable tools for connecting usual users and top executive managers.

There are some restrictions to this study that may affect research results and especially its generalizability. Firstly, e-CRM is a recent construct and obviously, few studied have been carried out on it in Iran. So, restricted theoretical background has impacted on offering a comprehensive definition and accordingly on reliability of the concept. To minimize the restrictions, we attempted to refer to more reliable studies in the field of e-CRM, when we reviewed theoretical backgrounds for the current study. Secondly, another restriction relates to mere usage of view-assessment tools for analyzing people's view about relationship between e-CRM Implementation Factors and Organizational Success; these tools cause systematic errors, due to their automatic nature.

Despite the aforementioned restrictions, this article paves the way for future studies and provides a developing and fair base of study. Since the concepts and range of marketing and communication are rapidly growing pervasive, e-CRM can combine these two fields in order to meet future market needs. In this respect, several topics can be identified for future

researches, including the following: website properties in e-CRM systems, organizational changes required to align with e-CRM systems, haw to personalize CRM and e-CRM to increase profitability, deploying CKM (Customer Knowledge Management) techniques to identify customers' needs in web environment, and role of human factor in success of e-CRM systems.

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