



Technological dimension of customer relationship management

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Abstract

The last several years saw the rise of Customer Relationship Management (CRM) as an important business approach. CRM is a widely-implemented strategy for managing a company's interactions with customers, clients and sales prospects. Its objectives are to increase profitability, revenue and customer satisfaction. To achieve CRM, a companywide set of tools, technologies and procedures promote the relationship with the customer to increase sales. Accordingly, the main aim of this paper is to review the technological dimension of CRM (independent variable) on customer satisfaction (dependent variable) and in the context of customer values (mediator variables). The present study is practical, descriptive and is of correlative type. Hence, hypotheses of the study will be analyzed using path analysis test in Structural Equation Modeling (SEM). The population sample of the study is all customers of LG domestic products in Shiraz. Questionnaire to gather information (based on Likert 5 scale multiple-choice) was used. Questionnaire reliability 95 percent and validity study to test content validity was used. In order to analyze the data LISREL 8.5 and SPSS18 software were used. The results showed that the technological dimension of the CRM in the context of customer value (functional value, social value, emotional value and customer perceived sacrifices) is influential on customer satisfaction.

Keywords: Technology, Customer Relationship Management, Customer Value, Customer Satisfaction.

Introduction

Customer values (i.e., functional/task value, social value, emotional value and customer perceived sacrifices/missed) are strategic weapon in attracting and retaining customers and one of the most effective factors in the success of CRM projects (Zeithaml *et al.*, 1996; Parasuraman, 1997; Woodruff, 1997; Zeithaml, 1998). Delivering superior customer value has become a matter of ongoing concern in building and sustaining competitive advantage by driving CRM performance (Wang *et al.*, 2004; Ahmad & Hashim, 2010; Sadeghi & Farokhian, 2010). CRM facilitates developing relationships with differentiated customers via interdependent collaboration with those of highest value to the company (Lowe, 2008; Sadeghi & Farokhian, 2010). As many researchers suggested, if companies want to improve the performance of their CRM they must regulate their activities based on best value creation thought (Day, 1994; Slater, 1997; Jensen, 2001; Ahmad & Hashim, 2010). The CRM goal is to create and deliver value to targeted customer (Buttle, 2004; Alaei Organi & Amini Lari, 2008). The consequences of CRM performance are the area of studies that generate much interest. To date, the primary focus of research has centered on the impact of customer relationship performance from the perspective of organizations, and customers' behavior. From the organization view point, previous studies found out that CRM can improve customer data and develop customer-centric (Berger & Bechwati, 2000; Bose, 2002; Tan *et al.*, 2002; Kim *et al.*, 2003; Mithas *et al.*, 2005;

Seeman & O'Hara, 2006). From the customer behavior perspective, CRM performance can increase customer loyalty, retention and satisfaction (Berger & Bechwati, 2000; Kim *et al.*, 2003; Fitzgibbon & White, 2005; Mithas *et al.*, 2005; Seeman & O'Hara, 2006; Alaei Organi & Amini Lari, 2008; Irfan *et al.*, 2009).

Customer satisfaction enables business to measure the behavior of customers after they contact with the organization, such as decreasing of customer complaint, repurchasing (Yoo & Park, 2007), and increases the volume of purchases (Colleen & Yeol, 2007; Mashinchi & Selamat, 2008). CRM projects are located in the commercial sector of information technology projects (Haghighat, 2008; Fasanghari *et al.*, 2008). To implement CRM, information and communication technology has made a tool available by which the companies can communicate with individual customers as if the customer is the only client of the company. Iranian companies, which experience a movement towards economic information, market competition and globalization, should be diligent in employing new strategies to maintain and expand domestic and foreign customers. The main question that is posed in this study primarily is that how customer relationship management (from information technology perspective) can be influential on customer satisfaction.

This paper has tried to address the literature of CRM and customer satisfaction, providing a conceptual model of CRM, customer value and then the technological dimension of customer relationship management. The

components of customer value are: functional value (task), social value, emotional value and customer perceived sacrifices (missed). Customer satisfaction will also be assessed based upon communication services such as (web, email, telephone, SMS and face-to face communication).

Theoretical Background

Customer Relationship Management (CRM)

In recent years, the business competition has been complex in both domestic and global markets because of the increasingly intense business competition and the strong trend of globalization. This uncertain environment has forced organizations to restructure themselves in order to increase their chances of survival and growth. The core of business has been shifted from a product orientation to a customer orientation means changing their market strategy from inside-out to outside-in. The emphasis here is on customer needs rather than on product characteristics. In short, the value of every customer is maximized (Alaee Organi & Amini Lari, 2008; Liou, 2009). The success of any organization primarily depends on how effectively the organizations manage relationships with the customers that lead to lifetime customers (Jagdish *et al.*, 2008). Customer relationship plays a major role in the competence development of business. Managers have found that the enhancement of existing customer relations cause the benefit of profitable and sustainable revenue growth (Lin *et al.*, 2006). Massey *et al.* (2001) argued that acquiring new customers can cost five times more than it costs to retain current customers. Furthermore, repeat customers can generate more than twice as much gross income as new customers (Winer, 2001; Fasanghari & Habibipour Roudsari, 2008). The key to build lasting customer relationships is to create superior value and satisfaction (Zangoueinezhad *et al.*, 2009; Quee Ling *et al.*, 2010). CRM involves building and maintaining profitable customer relationships by dealing with all aspects of acquiring, keeping and growing customers (Kotler & Armstrong, 2010). The rapid advances in information technology have presented firms with new technology-based solutions, namely CRM technology, to manage customer relationships. CRM technology is a suite of information technology-based solutions designed to support the CRM process (Rigby *et al.*, 2002; Haghighat, 2008; Fasanghari *et al.*, 2008).

In this regard, Brown (2007) defined CRM as 'the key competitive strategy you need to stay focused on the needs of your customers and to integrate a customer-facing approach throughout your organization'. Also Chatterjee (2000) believed that CRM is a discipline which focused on automating and improving the business processes associated with managing customer relationships in the area of sales, management, customer service and support.

The successful management of CRM can improve customer satisfaction and loyalty (Liyun, 2008;

Fasanghari & Habibipour Roudsari, 2008; Irfan *et al.*, 2009). Organizations need CRM to make specific sales channel resources more productive; customer relationships, and tasks to low-cost channels; migrate transactions, get multiple sales and service channels to work more closely with demand chain partners; and better leverage market programs and resources (Lin *et al.*, 2006). CRM is an organizational strategy which integrates People, Processes and Technology. Generally running and implementing an informational system and for the purpose of change management in any organization particular attention is given to three key elements of people, processes and technologies (Brown, 2000).

Technology is performed to maximize this communication with daily customers of the organization, distribution channel members, internal customers and suppliers. With the help of technology; co-ordination between sales sectors, marketing, customer service, field support and other face to face functions can further be obtained. CRM includes adoption of information technology related systems, training of employees and amendment in business processes related to customers. It is not just software but an approach to update and enhance business methods to improve customers' relationship with the organization (Haghighat, 2008).

According to the classification of Meta Research Company, generally there are three types of CRM technology in different frameworks which are connected together and each can interact with each other, and can prepare the necessary integration and co-ordination required to implement CRM of an organization (Greenberg, 2002):

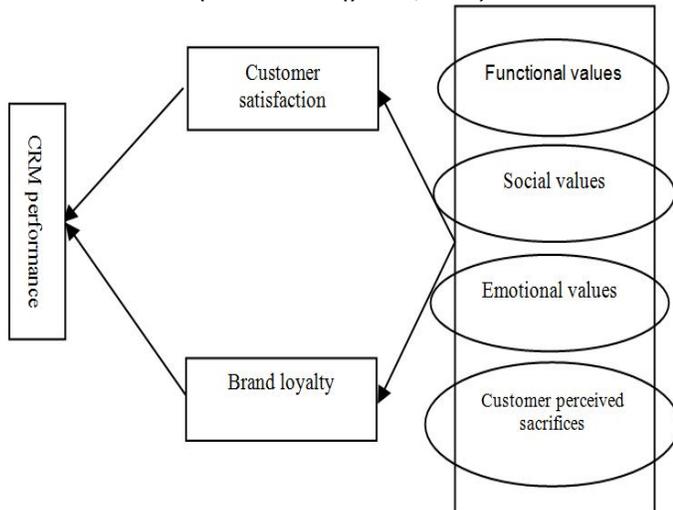
- *Operational CRM* provides automated support to "front office" business processes (sales, marketing and service). Each interaction with a customer is generally added to a customer's history, and staff can retrieve information on customers from the database as necessary.
- *Analytical CRM* analyses data (gathered as part of operational CRM, or from other sources) in an attempt to identify means to enhance a company's relationship with its clients.
- *Collaborative CRM* is an approach to customer relationship management in which the various departments of a company, such as sales, technical support, and marketing, share any information they collect from interactions with customers.

Customer Value (CV)

The value concept is one of marketing theory's basic elements. Identifying and creating customer value - understood as value for customers - is regarded as an essential prerequisite for future company success (Graf & Maas, 2008; Ahmad & Hashim, 2010). CV is a strategic process for product management, services, growth and the development of the business unit and increases competition share in market. Valuation based on market

research takes place and the advanced techniques of customer value analysis are used. Literature in marketing and quality management will emphasize the importance of CV (Blattberg *et al.*, 2001). It can be considered the core of constructing of new business concepts (Lindman, 2007). CV an important and strategic element in gaining competitive advantage, and is considered as a key factor in improving company relationships with customers (Bowman & Ambrosini, 2000). A proven experience of managing CV and to show definitive results in business is critical. The successful management of CV by different industrial companies around the world is used (Bowman & Ambrosini, 2000). The components of CV are: Functional Value (FV), Social Value (SV), Emotional Value (EV) and Customer Perceived Sacrifices (CPS). Wang *et al.* (2004) suggested a model based on the expected values of that which can be seen in Fig.1.

Fig. 1. Relation between CV, CS and CRM performance
(Source: Wang *et al.*, 2004)



Understanding what customer's value in different contexts and what CV creation strategies are more or less appropriate in particular contexts is central to business strategy and business thought.

Based on the model mentioned above, customer satisfaction has been proposed based on CRM functions in the form of customer value. Key dimensions of CV are defined as follows:

Functional Value (FV): It is based upon the time of delivery of the goods and commodities, desirability of the services at the time of purchasing, proper treatment and conduct of the vendors and service providers also after sale service. It refers to real or expected effects customers will receive from purchased products or services.

Emotional Value (EV): It is based on customer interests towards the product. Some customers when buying products or services may remember past memories, and this raises the incentive to purchase.

Social Value (SV): It is based on demographic and personal information of the customers in target market trends. Social character of the person buying the product is one of the dimensions of social value. For example, more young people interested in buying phones with many uses in shooting, information transfer systems and distribution of audio and video files. Yet the elderly population is most interested in buying simple and easy-to-use mobile phones

Customer Perceived Sacrifices (CPS): It refers to monetary and non-monetary costs a customer must give up in order to acquire a product or service.

Customer Satisfaction (CS)

CRM is a strategy that supports an organization's decision-making process to retain long-term and profitable relationships with its customers (Colleen & Yeol, 2007). In implementing CRM, a firm seeks to establish and maintain a long-term relationship with customers based on cumulative full CS as opposed to transaction-specific customer satisfaction (Reinartz & Kumar, 2002; Yim *et al.*, 2004; Zangoueznezhad *et al.*, 2009). CS has different levels of specificity in various studies. It is a vital CRM variable that can be defined as "the extent to which a product's perceived performance in delivering value matches a buyer's expectations" (Armstrong & Kotler, 2003). Oliver (Oliver, 1981) defined CS as "an evaluation of the surprise inherent in a product acquisition and/or consumption experience". Zeithaml *et al.* (1988) found that satisfaction is related to a specific transaction, whereas, service quality is a global judgment relating to the service's superiority.

CS varies over time and changes in CS levels depend on various factors: a). Time is an important factor in assessing CS, b). Evaluation and interpretation of CS can be challenging for companies, c). CS is a factor formed based on CV and has a close relationship with it. In order to assess a CRM program we should look into the value amount provided for the customer.

CS is important from the technological dimension of CRM. According to this, the CRM function is investigated operationally, analytically, and collaboratively. Operational CRM focuses on the business processes; whereas, analytical CRM focuses on applying analytical tools to transactional data. Collaborative CRM focuses on collaboration between the customer and the company (Colleen & Yeol, 2007).

Hypotheses

H1: Technological dimension of customer relationship management in the context of functional values has a significant and positive impact on customer satisfaction.

H2: Technological dimension of customer relationship management in the context of social values has a significant and positive impact on customer satisfaction.

H3: Technological dimension of customer relationship management in the context of emotional values has a significant and positive impact on customer satisfaction.

H4: Technological dimension of customer relationship management in the context of customer perceived sacrifices values has a significant and positive impact on customer satisfaction.

Research Methodology

This study aims to investigate the influence of the technological dimension on customer satisfaction in the context of functional value, social value, emotional value and customer perceived sacrifices. So, the study is practical in terms of the objectives and in terms of collecting and analyzing the data is descriptive (Bazargan *et al.*, 2008). Survey was the main method in this study. To do so, a questionnaire was designed, with 32 questions based upon Likert 5 scale multiple-choice. Three questions are related to personal information of the respondents. For reviewing any one of the practical, analytical, and collaborative dimensions of customer relationship management 3 questions were designed. For checking each of the mediator variables (functional value, social value, emotional value and customer perceived sacrifices) three questions were designed. For the dependent variable of customer satisfaction 8 questions were designed (For each of the communicational aspects, web and email, telephone, SMS and one- to-one communication 2 questions were designed). For analyzing the data derived from questionnaire factor analysis and Structural Equation Modeling/Path Analysis were used and the software which was used for analyzing the data is LISREL 8.5 and SPSS 18.

Population and Sample Size

Fig. 2. Infinite population sampling formula

$$n = \frac{Z_{\alpha/2}^2 Xp(1 - p)}{\epsilon^2} = \frac{(1.96)^2 \times 0.5 \times 0.5}{(0.06)^2} = 2.66.77 \approx 267$$

Population of the study consists of all LG products customers which they purchased the products from the company in winter 2010 in Shiraz. Sample according to the infinite population sampling formula (Fig.2) was estimated 267 people. Therefore, 280 questionnaires were distributed in a 30 days period among the population samples randomly. The total number of 267 questionnaires was analyzed. From 267 respondents, 26 individuals were under high school graduation, 38 high schools graduated, 66 had associated diploma, 99 with bachelor degree, 32 with master degree, and finally 6 people held a PhD degree. 63 percent of the respondents were male and 34 percent were female. And this is while the age of 46 of these people was between 20-30, 104 people 31-40, 56 people 41-50, 43 people 51-60 and 18 people were more than 61 years old.

Reliability and Validity of the Study

For determining reliability of the study Cronbach's Alpha method was used (Table 1). To determine the validity of the questionnaire content credit was used (Bazargan *et al.*, 2008).The questionnaire content validity was approved by distributing the questionnaires among a group of professors specializing in the field of customer relationship management and marketing.

Table1. Reliability

Questions	Cronbach's Alpha
Technological dimension of customer relationship management	0.93
Customer values	0.90
Customer satisfaction	0.93
All questions	0.95

Data Analysis

Goodness of Fit Tests:

Structural equation modeling (SEM) was used to determine correlations between variables of the proposed model and confirmed proposed model (Joreskog & Sorbom, 1996; Tomer & Pugesek, 2003). Although different types of tests which generally called fitness index are continuously being compared, developed and evolved but still there is no general agreement on any optimal test. The goodness of fit of a statistical model describes how well it fits a set of observations Measures of goodness of fit typically summarizes the discrepancy between observed values and the values expected under the model in question. Such measures can be used in statistical hypothesis testing. Generally, in this study to assess the goodness of fit of the entire model measures such as χ^2/df , RMR, GFI, AGFI, RMSEA, NFI, NNFI, CFI were used (Joreskog & Sorbom, 1996; Malaeb *et al.*, 2000; Tomer & Pugesek, 2000; Hair *et al.*, 2006; Heidarzadeh Hanzaaee & Sadeghi Tooraj, 2010; Delafrooz *et al.*, 2010). Numbers of each of these indices has come in Table 2. Due to the sensitivity of the chi-square test to sample size, the relative chi-square was used (it should be 3 less for an acceptable model (Tomer & Pugesek, 2003; Akm, 2008; Sorooshian *et al.*, 2010), Standardized RMSR should not be greater than 0.80 and GFI, AGFI, NFI, and CFI should exceed 0.90 to be acceptable (Hair *et al.*, 2006; Malaeb *et al.*, 2000; Heidarzadeh Hanzaaee & Sadeghi Tooraj, 2010).

Hypotheses Testing using Path Analysis

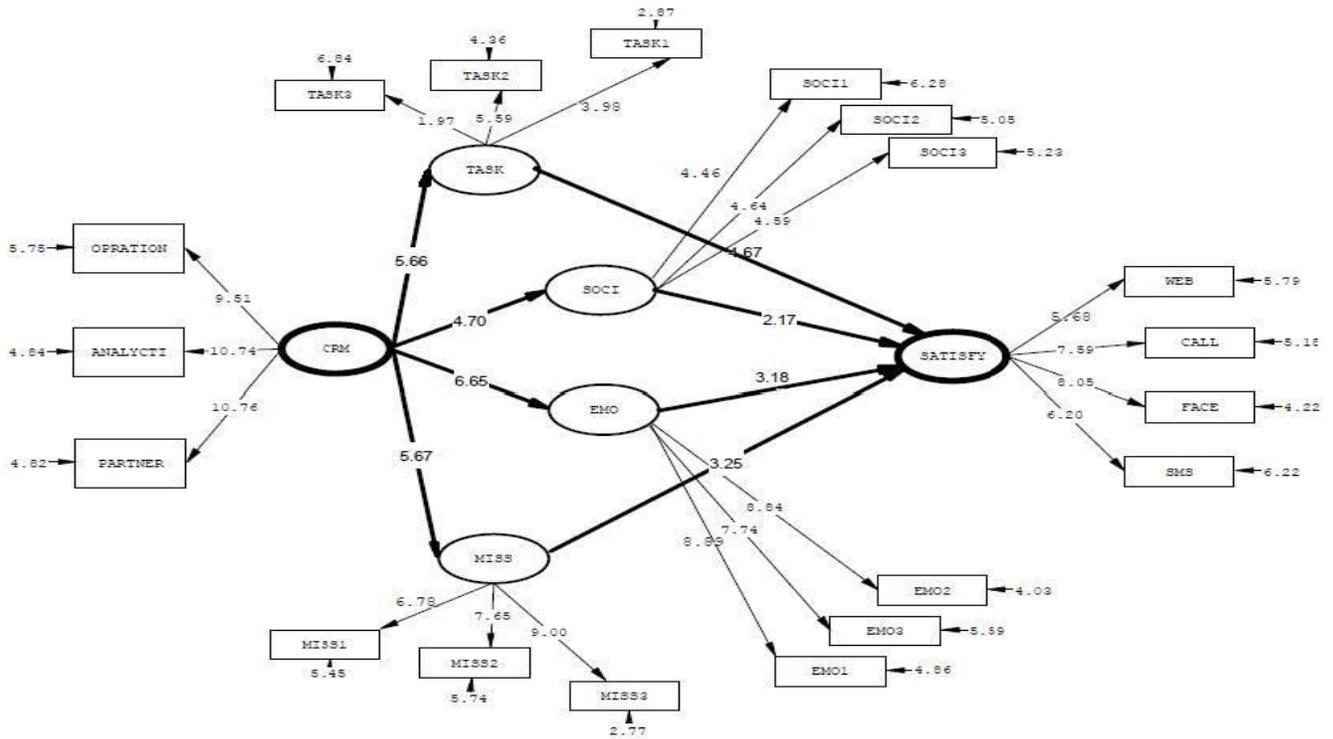
The Fig.3 shows structural model of the study for confirming the hypotheses in *estimation of standard-state* (Factor Loading). The Fig.4 also shows structural model of the study for confirming the hypotheses in significance state of parameters (t-Value).

The Table 3 shows the results of hypotheses of the study based on estimation state (factor loading). As can be seen in both directions factor loading is good for all the hypotheses.

Table 2. Goodness of fit tests

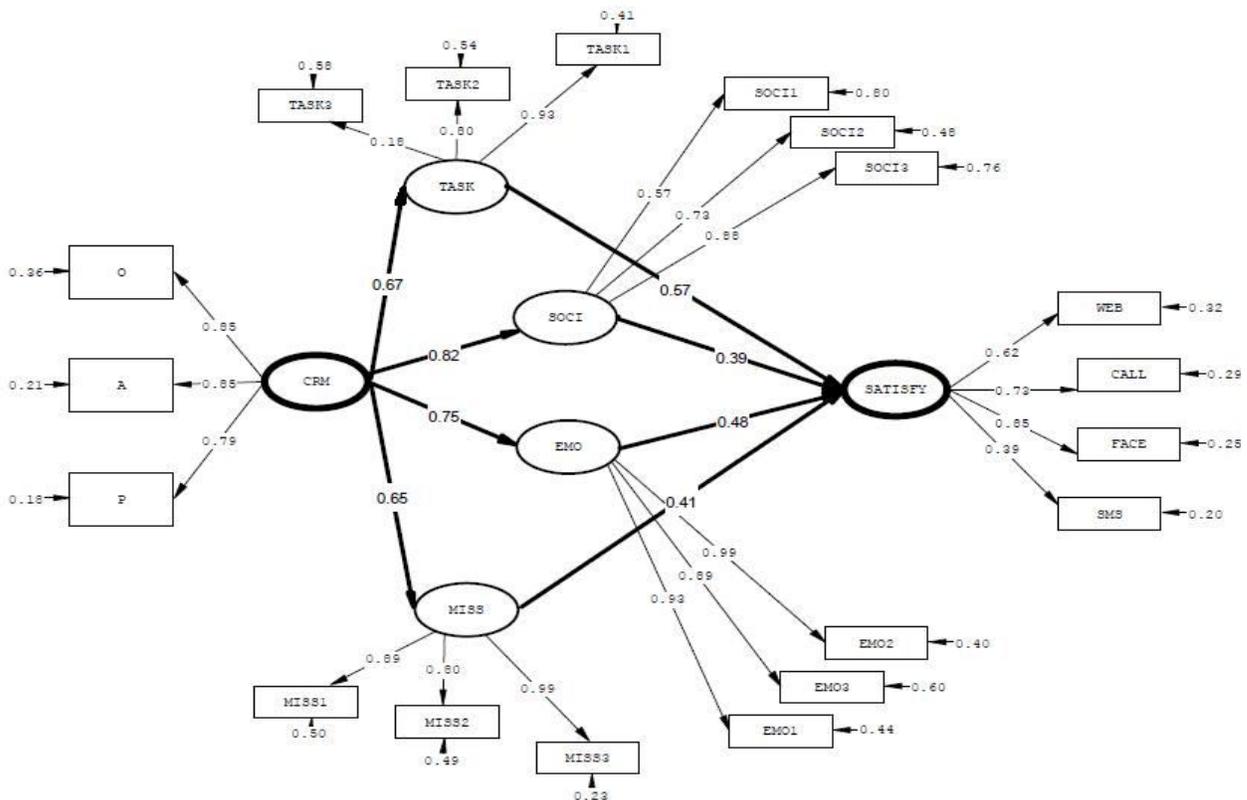
χ^2 / df	Root Mean Square Residual (RMR)	Mean Residual	Goodness of Fit Index (GFI)	Adjusted Goodness of Fit Index	Root Mean Square Error of Approximation	Normed Fit Index (NFI)	Non-Normed Fit Index	Comparative Fit Index (CFI)
2.105	0.042		0.96	0.96	0.073	0.99	0.96	0.99

Fig. 3. Structural model in estimation of standard state (Factor Loading)



Chi-Square=303.16, df=144, P-value=0.00000, RMSEA=0.073

Fig. 4. Structural model in significance state of parameters (t-value)



Chi-Square=303.16, df=144, P-value=0.00000, RMSEA=0.073

Table 3. Result of factor loading

Hypotheses	Path			Factor loading	Confirmed
FIRST	CS	FV	CRM	$0.67 \times 0.67 = 0.44$	√
SECOND	CS	SV	CRM	$0.82 \times 0.39 = 0.31$	√
THIRD	CS	EV	CRM	$0.76 \times 0.48 = 0.36$	√
FOURTH	CS	CPS	CRM	$0.66 \times 0.41 = 0.27$	√

The Table 4 shows the results of hypotheses of the study based on significance state of parameters. As can be seen in both directions for all the hypotheses Significance value is greater than 1.98. Therefore it can be claimed that at 95 percent of level of confidence none of the hypotheses will be within the null hypothesis.

Table 4. Result of t-value

Hypotheses	Latent variable path to mediator variable		Mediator variable to dependent variable path		t-Value	Confirmed
FIRST	CRM to FV	6.66	FV to CS	4.67	Greater than 1.96	√
SECOND	CRM to SV	4.70	SV to CS	2.17	Greater than 1.96	√
THIRD	CRM to EV	6.66	EV to CS	3.18	Greater than 1.96	√
FOURTH	CRM to CPS	5.67	CPS to CS	3.26	Greater than 1.96	√

According to the data analysis results it can be claimed that the technological dimension of customer relationship management is effective on every four dimensions of customer value.

Discussion and Conclusion

CRM from the technology perspective due to its importance in implementing marketing policies, sales and customer service component of the overall strategies of the organizations has risen as an important pillar in the overall organization strategies. Therefore, the guaranteed high performance of the organizations must be sought in a successful CRM, and for achieving these objectives of the organization the task should begin with those who are associated directly with customers. This factor caused the formation of the customer orientation approach in the organizations and brought up the customer value as a performance indicator in CRM. This value has come under consideration in the context of dimensions such as functional, social, emotional and customer perceived sacrifices values and also been known to show the customer ultimate value. It is a value which is primarily based on the technological dimension of CRM and has an impact on customer satisfaction.

Studies of Wang *et al.* (2004) showed that functional values improve business performances, social values enhances the attraction of new customers, emotional values retain the old customers and customer perceived sacrifices values improve the efficiency and effectiveness of customer relationship management. All these results bring about increase in customers satisfaction. In this research it is shown that information technology plays the role of a facilitator in achieving this goal.

Zangouinezhad *et al.* (2009) also studied the impact of information technology on customer satisfaction. Fasanghari

et al. (2008) studied the role of electronic customer relationship management on the business process improvement. All of them confirmed the positive role of information technology on the simplification of rendering, availability and the reliability of the services. The present research has also come to the conclusion of the above mentioned studies' findings. The results showed that information technology is an inseparable part of customer relationship management.

According to the cases cited, this study has tried to examine the relations between the independent variable of CRM (from the technology perspective) and customer satisfaction as the dependent variable. Customer value was proposed in the form of the functional (task) value, social value, emotional value and customer perceived sacrifices (missed) as a mediator variable in the research conceptual model. Results of fitness indicators of the model show that the proposed model is confirmed. Therefore, the proposed model was suitably able to place the variables of the study (including variables of technological dimension of customer relationship management as latent variables and customer values as mediator variables and customer satisfaction as dependent variables) and shows their relationship with their dimensions.

The research hypotheses test showed that the technological dimension of customer relationship management in the context of the above mentioned values has a positive and significant impact on customer satisfaction of the products and services of LG Company.

Hypotheses testing results are shown in Table 3 and 4. Using technology, CRM improves quality and quantity to provide better customer service. This service that now is a part of the product and the main function of the businesses causes an increase in customer satisfaction. This can be pursued in overall tends of LG Company customer service.

The first hypothesis of the study has also confirmed the accuracy of these results. Social values can be sought in the context of customer personal information or customer profile. Technological approach of customer relationship management has expanded the IT infrastructure in companies and provided a background for easier and faster access to customer information. This information not only does not break customer privacy, but also because of familiarity with current needs and even discovering new customer needs, has increased their satisfaction. Results indicate that due to the developed technological infrastructure of LG Company, the customers consciously give their personal information. This suggests the satisfaction which is shaped by social values. The second hypothesis also shows the accuracy of this information. Considering the emotional values formed due to the use of the product is another factor that increases the customer satisfaction. This value can be observed in the product repeated purchases. Due to the importance of this value, the technological dimension of CRM in a company, will introduce the product while keeping customer's state of mind. This type of product introduction in LG Company is done through the continuous communication between the customer and the company and technology systems in the context of SMS, email and web sites, etc. The third hypothesis of this study

also confirms the results. Customers cannot always be satisfied. This dissatisfaction may be due to flaws in the physical product or service associated with it. This lack of satisfaction, as previously mentioned can be considered as customer perceived sacrifices values. Considering the technological dimension of CRM in addition to identifying the defects before purchasing the product, based on the previous value offers the best service at the best time and place to the customer. Therefore, understanding and discovery of the defects is essentially valuing of the customer. The forth hypothesis also shows the importance of this value in increasing the customer satisfaction of LG Company.

So in addition to the innovation in this study based on the three dimensions of customer satisfaction, customer value and CRM, it can be claimed that using new technologies based on Information Technology (web, email, telephone and etc.) in addition to increasing the customer satisfaction from the delivered services, the company's profitability will also be heightened.

Limitations and Recommendations

Any scientific research is influenced by some limitations and this study is no exception. The most important limitation of this study was the sales representative employees' poor performance and co-operation and the customer relationship of LG Company of the population sample in response to the questionnaire. The period in this study was limited. Basically, it should be broad enough to cover all the factors that influence the behavior of the respondents. For example, there would be economical and political developments which can affect decisions and the behavior of the individuals. Other limitations of this research study are the conditions and territory location (Shiraz City). The results of this study probably cannot be generalized to other cities.

In future researches it is recommended that other mediator variables can be identified and tested and while testing the model in other parts of the country, a comparison among the present study findings and the future researches can also be done. So some of the most important suggestions for future researches can be as under:

- Study the Interrelationships between the components of Customer Relationship Management
- Study the effectiveness of Customer Relationship Management on the entrepreneurial opportunities
- Study the relationship between marketing and sales strategies and their impact on customer relationship management.

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