

Data analysis and customer relationship management (CRM) in the restaurant industry

Elahe Avazzadeh^{1*}, Abdolmajid Karami²

1. Master of business administration- financial management, Yazd University, Iran, Visiting Lecturer Payam Noor University of Darab, Iran
2. Master of Mechanical -Energy Conversion Engineering, Islamic Azad University, Bushehr, Iran

Corresponding Author email: Avazzadeh2009@yahoo.om

Abstract: Nowadays, restaurant and establishing restaurant are one of the businesses that attracts attention of a lot of persons but a lot of investors are may be unaware of scope of this problem. They don't know that this occupation is good and it has a good income but also It has so many risks. Considering these risks leads to its survive and not considering its risks leads to bankruptcy of the investment. So, it is necessary to pay attention to suitable management of restaurants. Goal of this research is recognizing the effect of customer relationship management on customer life time value by explaining the quality of mediator role in the restaurant industry. Method of this research is a descriptive – correlative method. Structural equation model is used for data analysis. Statistical society of this research is customers of restaurants of Darab city. Sample size is about 348 ones that are selected by simple accidental sampling method and Cochran sampling formula for unlimited populations. Tool of gathering data was a standard questionnaire that its reliability was 90% by Cronbach's alpha. Data of this research were analyzed by Lisrel software. Its results show that customer relationship management has a positive and meaningful effect on relationship quality and relationship quality has a positive and meaningful effect on customer life time value and its dimensions (use of services rate, loyalty, advertisement and tend to refer or revisit).

Key words: data analysis, customer relationship management, relationship quality, customer life time, restaurants of Darab city and Lisrel software

INTRODUCTION

Customer relationship management which has been known as a new and modern phenomenon refers to 1990s. Customer relationship management is a business strategy of customer mutual relationship management for optimizing value and long term satisfaction of customers [8]. In fact, customer relationship management is planning an organizational structure for mutual value by this process [26]. Customer relationship management is the process of creation and retention of consumer's relationship in business cycle [22]. Relationship quality is an important indicator of appraisal of relationship power between supplier and customer. Most of researches believe that trust, satisfaction and commitment of customer are key factors of relationship quality appraisal. Kerasbi et al concluded that satisfaction and trust are two main elements of relationship quality [10]. Sanchezgarsia et al claim that trust and commitment are key factors of relationship quality appraisal [23]. Garbarino, Johnson & Smith concluded that relationship quality is formed by satisfaction, trust and commitment. We can define customer life time management as following: It is a cycle that begins from customer information management. This cycle defines customer behaviors. It comprises all of processes of corporation; from attracting customer to sell product- services to customer and long term relationship retention [7]. Stone & Jakob believe that customer life time value is net income present value of customer minus all of the related costs [25]. Restaurants want to develop and promote their relationship quality with customers as service providers. They try to control the costs, so restaurant managers become aware of this conflict. One way of addressing this problem is endeavoring in retention of customer and stimulating customer for repurchase because attracting a new customer is more costly than customer retention [21]. Customer relationship management and paying attention to relationship quality with customer is a comprehensive process that leads to maximum benefit and profit of customer relationship [29].

Theoretical principles and framework of research

Theoretical principles

Data analysis

Data analysis has various definitions in academic literatures. Data analysis is introduced as a tool in some of the definitions of data analysis that able users have a direct relationship with high volume of data. Some of them present more precise definitions. These definitions pay attention to searching data. Some of these definitions are as following:

Data analysis is the process of mining valid data from previously unknown understandable and reliable wide spread data base and using these data in decision making about important business and commercial activities [16]. Term of data analysis refer to semi-automated process of analyzing wide spread data base in order to find suitable samples [16]. Data analysis means searching a data base in order to find hierarchical log linear data sample [11]. Data analysis means having large scale, reliable and new knowledge about wide spread data base. As it is seen in different definitions of data analysis, it is usually pointed to some concepts such as mining of knowledge, analysis and finding a hierarchical log linear data sample.

Customer relationship management

CRM retrieved from Customer Relationship Management. Customer relationship with organization and their needs are considered and analyzed mainly by utilizing CRM. In fact, CRM is the process of gathering and integrating information in order to utilize them effectively and targeted. These information are used for customer relationship, sale, effective marketing, sensitivity or market needs. Customer relationship management is a commercial process that addresses all of the aspects of customer characteristics, provides customer awareness, forms some relationships with customer and their perception of organizations products and services. Customer relationship management is defined by four elements of a simple framework: knowledge, target, sale and service [9].

Quality relationship

In fact, customer relationship quality describes depth of relationship that leads to satisfaction, loyalty, positive oral statements, collaboration, sale growth and customer retention. In this section, we study three following factors as the structure of results of customer relationship quality according to conceptual, Verdugo & Veerapermal model. These factors are as following:

Rate of purchase: First outcome of promotion of customer relationship quality is customer rate of purchase. Satisfied customers tend toward suppliers because consumers spend their money where they are satisfied from it [14]. Loyalty is a key variable of customer retention because loyal customers have less sensitivity toward price [13]. At the same time, satisfied customer has more willingness toward spending money than other customers and they repeat their high volume purchasing [6].

Customer continuous relationship: Second outcome of relationship quality promotion is having customer continuous relationship. On the other hand, it is willingness of both of parties for having long term cooperation or indefinitely cooperation agreement in the future. Having customer continuous relationship is known as the most essential source of benefit and survives of organization [17].

Oral statements: Ordinary people statements are one of the results of customers' relationship. Oral statements point to informal relationships. Informal relationships conduct other consumers toward consuming goods and services. Oral statements are known as one of the greatest effective sources of data transfer since the beginning of human- social system [19].

Customer life time value

Customer value points to potential interaction between customers and industry during definite periods of time. When the so-called industry perceive the customer value, we will see that customer value can offer customized services to different customers, so we can get an effective customer relationship management [1].

Generally customer life cycle has four steps:

Potential customers: Individuals who are not customer yet but they are in the target market.

Customers who react: Potential or accidental customers that are interested to one product or service and react toward it.

De facto customers: Individuals that use an organizational product or service.

Former customers: These customers are not suitable because they don't spend more time for sale and they purchase opponent products [9].

Relationship between customer relationship management and relationship quality

Customer relationship management can decrease transaction costs or customers' uncertainty, so relationship between consumer and institute improves. Kerozesbi et al recommend that customer relationship management can improve the relationship quality, and one of the most important factors of evaluation is strength or weakness, good and bad relationship between institute and customer [10]. Garbarino & Johnson found that customers who have stronger relationship with institute have a more positive attitude toward institute affairs. Generally, they have more positive view points toward relationship quality factors. For example, degree of trust, satisfaction and commitment. Since trust, satisfaction and commitment are the bases of relationship quality, customer relationship management has a positive effect on relationship quality apparently [12].

Relationship between relationship quality and customer relationship management

Last goal of customer relationship management is increasing of customer life time value for institute; so at last, customer relationship management will promote customer life time value by relationship quality. Peer & Ragerz found that customers who have a high relationship quality will recommend a product to their relatives and friends orally. These customers have more willingness toward repurchase and also more loyalty. Additionally, customers who have more loyalty will help the cooperation in long term profitability and they also increase sale and benefit and profit[20]. Lu & Hesie found that relationship quality has an effective impact on quantity of customer use, loyalty, willingness toward purchasing product and goods and oral advertisement [18].

Research literature

Ihtiar et al in a research entitled, " An integrated framework, intercultural qualifications, service quality and customer satisfaction in Grocery retailing ", concluded that intercultural qualifications has an important role in integrated framework of service quality and customer satisfaction[15]. Yemamahisavari in a research entitled, "Exploring internal service quality in a manufacturing organization", presents some concepts about human resource managers according to knowledge development and internal service quality [27]. Veisi & Ghoravi studied three case studies such as forecasting customers demanding services, considering customer defection in Internet and also considering the effect of brand equity on customer shopping bag in Grocery retailing in their research and their data was analyzed by different methods of data analysis.

Safari Kahreh et al in a research entitled, "Customer long term value analysis for segmentation and customer profitability management in Iran Tejarat banks" planned a model for calculating CLV. CLV has unique characteristics. Banking customers have executional and operational capability in calculating CLV. They classified customers in six classes by clustering method. Each class has same features based on CLV. Some programs are considered for each class and are executed [3]. Bashri Moosavi et al in a research entitled, "analyzing customer value by data analysis techniques and phase hierarchical analysis", focused on banking industry and they integrated data analysis techniques and management issues for customer value analysis systematically and they also formed customer value pyramid by scoring model[1]. Maslahi et al in a research entitled, "Use of model of LRFM for segmenting customers based on their life time value", planned six general phases and these six phases were weighted for 921 customers by group hierarchical analysis after determining rates of model indexes such as duration, customer relationship, novelty of exchange, number of exchanges, and monetary value of exchange. They were segmented in 16 groups and 5 main clusters of loyal customers, potential customers, new customers, missed customers and high consumer customers according to diagnostic analysis. Their life time value was determined and results provided the ground for analyzing characteristics of corporation customers [4]. Mahadavi & Moosavi in a research entitled, "presenting a framework for weighting customers long time value in the process of customer relationship ", presented a model for calculating customer long time value by which customers are grouped as respectively profitable and non-profitable. Effective factors in customers' long time value were also determined. The most important factors are: rate of customer churn, legal reserves, profit margin, discount rate, direct and indirect costs of accounts that are presented as mathematical variables in the sample [5].

METHODOLOGY

Goal of research

Determining the effect of customer relationship management on customer life time value by explaining the role of relationship quality in restaurant industry of Darab city

Conceptual model of research

At last, we can use two methods for planning the analytic model. There is no definite difference between these two methods. They may at first formulate the hypothesizes, then address the concepts or they conduct a reverse way [2]. So, hypothesizes are defined based on the above reasoning and opinions of professors and experts are explained based on theoretical principles of research according to marketing and restaurant. Conceptual model of research is planned and explained as following:

Research hypothesizes

Main hypothesizes

Customer relationship management has a meaningful effect on relationship quality in restaurant.

Relationship quality has a meaningful effect on customer life time value in restaurant.

Secondary hypothesizes:

Relationship quality has a meaningful effect on use of services in restaurant.

Relationship quality has a meaningful effect on loyalty in restaurant.

Relationship quality has a meaningful effect on oral advertisement.

Relationship quality has a meaningful effect on willingness of refer or revisit the restaurant.

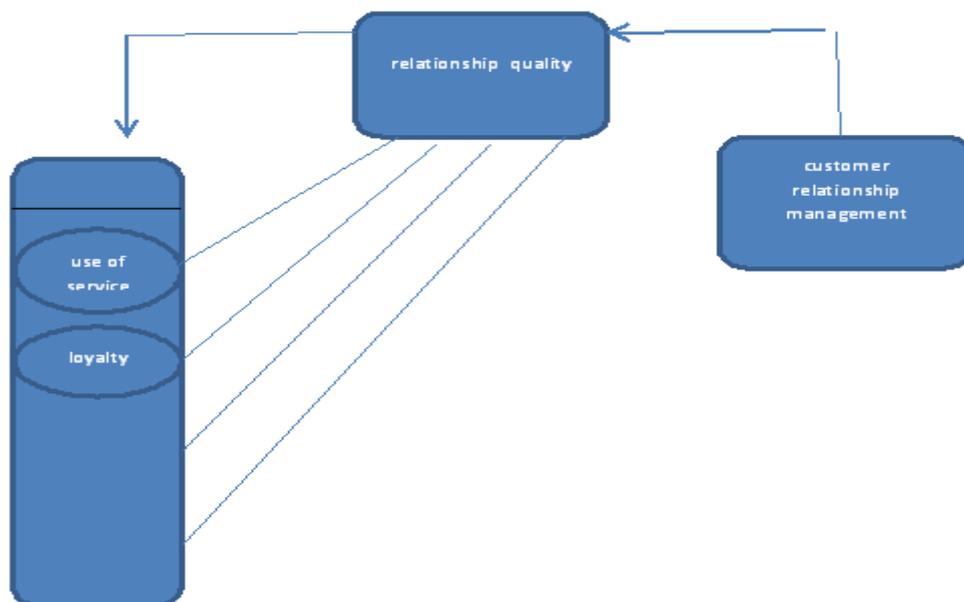


Figure3-1: Conceptual model of research

Methodology and data tool

The present research is a descriptive- correlative research. A questionnaire pack which is comprised of three standard questionnaires is used for gathering data:

Table3-1: detailed information of research questionnaires

Number of items	Spectrum	Scale level	Dimensions	Variable
10	5 Likert score	Ordinal	-----	Customer relationship management
10	5 Likert score	Ordinal	-----	Relationship quality
3	5 Likert score	Ordinal	Use of services	Customer life time value
3	5 Likert score	Ordinal	Loyalty	
3	5 Likert score	Ordinal	Advertisements	
3	5 Likert score	Ordinal	Willingness to revisit or refer	

Reliability and validity of questionnaire

Validity of content method is used for evaluating of validity and localization of questionnaires. The present questionnaire is standard and its localization is approved by 8 experts. SPSS software is used for reliability evaluation of the research and the calculated Cronbach's alpha coefficient is equal to 90%. Cronbach's alpha coefficient of all of the research variables are also shown in table 3-2.

Table3-2: Reliability coefficient of research variables

Cronbach's alpha coefficient	Dimensions	Variable
0.912	-----	Customer relationship management
0.908	-----	Relationship quality
0.896	Use of services	Customer life time value
0.934	Loyalty	
0.922	Advertisements	
0.899	Willingness to revisit or refer	
0.902	-----	Total of questionnaire

Statistical society, sample size and sampling method

Statistical society of this research is the customers of restaurants of Darab city. Number of them is indefinite. 348 ones that are selected by Cochran sampling formula for unlimited populations. Sampling method is a simple accidental method.

Techniques of data analysis and description

Data are analyzed by structural equations and Lisrel software.

Main and secondary hypothesizes test by structural equations modeling

We study independent variable (customer relationship management) effects on mediator variable (relationship quality) and final dependent variable (customer life time value). So, structural equations modeling are selected as statistical method because of independent variables, dependent variables and also multivariable recommended sample. There are various methods for executing the structural equations model. One of the methods is covariance based structural equations model that is used for normal variables and high sample sizes. Using covariance based structural equations model needs its own software. Lisrel software is used more than any other software.

Data analysis and findings

We use structural equations model and Lisrel software for data analysis. Two different models are used for testing main and secondary hypothesizes in this research. The main hypothesis is tested by the first model and secondary hypothesizes are tested by the second model.

Studying structural model (path analysis) for the main hypothesizes

As it is shown in table 4-1, conceptual model of research and meaningful coefficients are used for testing the main hypothesizes of research. If T- value is more or less than 1.96, H0 is rejected and H1 is approved. As it is shown in table4-1, the rate of effect of customer relationship management on customer relationship quality in restaurants of Darab city is equal to 70% and its meaningful rate is equal to 5.6. The rate of effect of relationship quality on customer life time value in restaurants of Darab city is equal to 75% and its meaningful rate is equal to 4.77. H0, H1 of approving or rejecting the hypothesizes are as following:

H0: There is no meaningful relationship between these two variables.

H1: There is a meaningful relationship between these two variables.

Table4-1: Summaries of approving or rejecting the hypothesizes are shown.

Table4-1- Results first and second main hypothesizes analysis

Test result	Dependent variable	Independent variable	T- value	Standard coefficient
Approved	Relationship quality	Customer relationship management	5.06	70%
Approved	Customer time life value	Relationship quality	4.77	75%

Variables of customer relationship management or CRM, relationship quality or RQ and customer life time value or CLV are shown in figures 4-1, 4-2.

Standard evaluation model

Figure 4-1: Meaningful model of the main hypothesis in standard evaluation state

Model in meaningful coefficients state

Figure4-2: meaningful model of the main hypothesis in meaningful coefficients state

Studying the structural model (path analysis) for the secondary hypothesizes

Table 4-2 shows the effect of relationship quality on dimensions of variables of customer life time value (rate of use of services, loyalty, advertisements and willingness to refer or revisit). As it is shown in table 4-2, the rate of effect of relationship quality on rate of use of services in restaurants of Darab city is equal to 83% and its meaningful rate is equal to 5.89. The rate of effect of relationship quality on customer loyalty in restaurants of Darab city is equal to 74% and its meaningful rate is equal to 6.35. The rate of effect of relationship quality on customer advertisements in restaurants of Darab city is equal to 60% and its meaningful rate is equal to 5.45. The rate of effect of relationship quality on customer willingness to refer or revisit in restaurants of Darab city is equal to 57% and its meaningful rate is equal to 4.49.

Table 4-2: Results of secondary hypothesis analysis

Test result	T- value	Standard coefficient	Rate of effect
Approved	5.89	83%	Rate of effect of relationship quality on use of services
Approved	6.35	74%	Rate of effect of relationship quality on loyalty
Approved	5.45	60%	Rate of effect of relationship quality on advertisements
Approved	4.49	57%	Rate of effect of relationship quality on willingness to revisit or refer

Variables of relationship quality RQ, rate of use of services SER, loyalty LOY, advertisements ADV and willingness in revisit or refer in figures 4-3,4-4.

Standard valuation of model

Figure 4-3: Meaningful model of secondary hypothesizes in standard estimation state and meaning coefficient state

Figure 4-4: Meaningful model of secondary hypothesizes in meaningful coefficients state

CONCLUSION AND RECOMMENDATIONS

This paper study and explain the correlation between variables such as customer relationship management, customer life time value and also relationship quality as a moderator of these relationships in restaurant industry. Sufficient and necessary data are gathered by field method and questionnaire after reviewing theoretical principles and previous literature in order to study the relationship between variables. Hypothesizes of this research were tested by statistical tests and Lisrel software. Test of the main hypothesis showed that there is a meaningful relationship between customer relationship management and relationship quality. Standard coefficient of both of the variables customer relationship management and relationship quality is equal to 0.70 based on the structural equations modeling. This relationship is the reason of approving the hypothesis based on $t=5.06 (> 1.96)$. This finding is according to the findings of some researchers such as Matlahi et al and Verdugo & Veerapermal [4, 28].

The second main hypothesis shows that relationship quality has a meaningful effect on customer life time value. Standard coefficient of both of the variables relationship quality and customer life time value is equal to 0.75 based on the structural equations modeling. This relationship is the reason of approving the hypothesis based on $t=4.77 (>1.96)$. This finding is according to the findings of some researchers such as Mahdavi, Moosavi, Berari, Ranjbaran and Verdugo & Veerapermal [5, 28].

On the other hand, secondary hypothesizes of this research were also tested. Their results are as following: First secondary hypothesis suggests that relationship quality has a meaningful effect on use of services. Standard coefficient of both of the variables use of services and relationship quality is equal to 0.83 based on the structural equations modeling. This relationship is the reason of approving the hypothesis based on $t=5.89 (>1.96)$. This finding is according to the findings of some researchers such as Moosavi et al, Verdugo & Veerapermal [5, 28].

Second secondary hypothesis suggests that relationship quality has a meaningful effect on customers' loyalty. Standard coefficient of both of the variables use of relationship quality and customers loyalty is equal to 0.74 based on the structural equations modeling. This relationship is the reason of approving the hypothesis based on $t=6.34 (>1.96)$. This finding is according to the findings of some researchers such as Berari, Ranjbaran, and Verdugo & Veerapermal [28].

Third secondary hypothesis suggests that relationship quality has a meaningful effect on advertisements. Standard coefficient of both of the variables use of relationship quality and advertisements is equal to 0.60 based on the structural equations modeling. This relationship is the reason of approving the hypothesis based on $t=5.45 (>1.96)$. This finding is according to the findings of some researchers such as Berari, Ranjbaran, and Verdugo & Veerapermal [28].

Fourth secondary hypothesis suggests that relationship quality has a meaningful effect on willingness of revisit or refer. Standard coefficient of both of the variables use of relationship quality and willingness of revisit or refer is equal to 0.57 based on the structural equations modeling. This relationship is the reason of approving the hypothesis based on $t=5.49 (>1.96)$. This finding is according to the findings of some researchers such as Moosavi et al, Berari, Ranjbaran, Verdugo & Veerapermal [28, 5].

Since all of the hypothesizes of this research is approved based on the result of tests of hypothesizes, it is recommended that managers of restaurants of Darab city pay attention to following notes:

It is recommended that restaurant managers use their staff abilities, skills and experiences more than before, so that they have a sense of belonging to the organization meanwhile they develop their abilities.

It is recommended that organizations hold up communicative skill training courses for staff. Staff will learn how to communicate with customers so that the rate of satisfaction of organization increases while there is more mutual respect between customer and staff of restaurant. It can lead to better performance of restaurant staff. Providing mutual communicative grounds between managers and staff so that restaurant manager and staff have a better communication formally and informally. This communication has a positive effect on more productivity of restaurant.

Greater autonomy of restaurants can have a positive effect on staff performance, so it is necessary that staff has autonomy in the framework of explanation of duties of staff, then the performance of staff increases while they have more sense of responsibility.

It is also important to pay attention to physical and hygienic conditions of work place such as lighting, heating and cooling equipment according to the season,... . It can lead to customers' satisfaction.

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