Int. J. Hum. Capital Urban Manage., 2(1): 17-28, Winter 2017
DOI: 10.22034/ijhcum.2017.02.01.002

**ORIGINAL RESEARCH PAPER**

# Comparing performance of organization on implementation of customer relationship management systems using ANP and TOPSIS hybrid approach

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Received 30 August 2016; revised 25 October 2016; accepted 15 December 2016; available online 1 January 2017

**ABSTRACT:** As the customers are the main reason of the formation and survival of the organization, not only understanding their obvious needs, but also forecasting, determining and guiding their hidden needs, design and implementing plans of offering services for meeting these needs for attracting customers are among cornerstone of any activity in the organization. In this research, one compares the performance of e-commerce organizations, including three firms, namely Dijikala, Bamilo and Iranian regarding the implementation of Customer Relationship Management system using multiple criteria decision making approach. Along with this, hybrid fuzzy multiple criteria decision-making approach, including fuzzy network analysis has been used for examining the priority of each one of the dimensions and indexes of the proposed model and fuzzy TOPSIS technic for examining discussed options priority. The statistical population of this paper includes 12 experts, including directors and managements and assistances of three e-commerce firms. The results obtained from the study show that customer output group has the highest weight among other variables. Similarly, among evaluated indexes, the customer loyalty dimension has the highest weight in the implementation of Customer Relationship Management. The results of TOPSIS approach also show that among the studied firms, Dijikala has the best performance in implementing Customer Relationship Management.

**KEYWORDS:** *Customer Relationship Management (CRM); E-commerce; Fuzzy TOPSIS technic; Multiple criteria decision making; Network analysis; Organization*

## INTRODUCTION

In today's business environment, customers are certainly seeking new levels of services and they only choose the firms which offer higher level and better quality services which meet their needs at the best. Customer Relationship Management (CRM) as an approach has been developed based on keeping a long term relationship with the customer. The customer is at the center of CRM, because customer purchasing the goods and services produces income for the organization. Firms can keep the customers by offering appropriate goods and services and to expand their relationships with them (Laudon *et al*., 2011). Similarly, through Information Technology (IT), they can acquire the intended information on the customer behavior and analyze this information for better personal interaction with customers. Among most important outcomes of CRM, one can point out the improved efficiency, reduction of cost, and increased profitability, increased sale, increased customer value, satisfaction and improvement of customer loyalty (Öztayºi *et al*., 2011).

Customers should be considered as the main reason of existence of the organization, therefore, not only

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understanding their obvious needs, but also forecasting, determining and guiding their hidden needs, design and implementing plans of offering services for meeting these needs for attracting more customers are among cornerstone of any activity in the organization. In recent years customer satisfaction is not enough for keeping them in organization, and one also should ensure about their loyalty in addition to their satisfaction. Along this, the objective of any organization is the establishment of long term and mutual good relationship with customers and other organization's interested groups, so that more customers are kept and fewer customers would leave the organization. The outcome would be increased market share and profitability for the organization.

CRM is a strategy among organizations which has been extensively implemented in the management and support of firm interactions with customers and sale requesters (Pai and Tu, 2011). Based on CRM concepts, the process of implementing CRM for the organization is recommended to be started from operational CRM and to reach analytical CRM and after that, it would entail interactive CRM. Before implementing a CRM it is recommended that the organization would be reorganized based on its business objectives, thus one of very important factors is analyzing the processes which are related to customer interaction in one way or another. Furthermore, all the interaction with direct or indirect relationship with customers should be evaluated.

In the first place, some firms assumed the CRM as the investment in technology and software, whereas some firms deemed it as something beyond this and they considered it as productive and useful relations with customers. This study tries to investigate all the criteria for Customer Relationship Management and also examine the importance degree of each one of these criteria. Therefore, this study aims to answer to two main questions as follows. Firstly, how is the priority of identified indexes regarding the optimized performance of CRM systems? Secondly, among three under the study firms in this paper, which one has the optimal performance with regard to others when it comes to e-commerce.

*Customer Relationship Management (CRM)*

CRM has been developed as a new term in mid-1990s (Gummesson, 2004). CRM, which sometimes called as customer management, customer value management, customer orientation or customer-oriented management, has been the common term for expressing the willingness of companies for establishing a continuous and permanent one-to-one relationship with all customers. Along this, one can note that attention to some topics such as customer attraction, delivery of required services, as well as retaining the customers would improve the profitability and enhances the organization competitive position in intended industry (Giannakis-Bompolis and Boutsouki, 2014). In fact, CRM represents all processes and technologies which organization adopts for identifying, selecting, promoting, expanding, retaining and delivering service to customers. This empowers managers to enhance sale, service delivery and expanding it through drawing on the customer knowledge and consequently improved profitability (Giannakis-Bompolis and Boutsouki, 2014). CRM serves as a strategic necessity for all organizations, because its effective implementation increases customer satisfaction, loyalty and attracting them, and consequently increase sale and repurchase. Some of the organization faces with problem for implementing CRM because their attitude to this concept is merely technological (Ngai, 2005). That is, they assume CRM strategies the same as CRM technology, while this problem is not technological but it is business problem to which IT tools should be allocated, designed and to be coordinated with business operations and strategies.

In general, CRM systems are classified into three forms:

1. Operational CRM: in this method all steps of CRM from marketing and sale to after sale services and receiving feedback from the customer is appointed to an individual in such a way that vendors and engineering services would be able to have access to profiles of each customer without reference to that individual. Among operational CRM tools and methods, one can mention the mechanized sale system which undertakes all functions relating to contact management, stock exchange and sales office management. The CRM operational section usually includes three general business parts, namely, Sales Force Automation (SFA), Customer Support and Service (CSS) and Enterprise Marketing Automation (EMA). EMA provides information on competitors, market trend and environmental macro variables (Shanmugasundaram, 2008; Nazari-Shirkouhi *et al.*,

2015). SFA automates some sale and management of sale processes. This section collects and follows up the information related to purchasing habits, taste and demography of customers and efficiency of sale section staff. CSS is responsible for automation of some services such as requesting information, complaints, returned products and, etc. (Nguyen and Mutum, 2012).

2. Analytical CRM: In analytical CRM, some tools and methods are used which analyzes the information from operational CRM and prepares its results for management of commercial performances. In fact, operational and analytical CRM mutually interact with each other, that is, data from operational section is handed to analysis section. After analyzing data, the obtained results have a direct effect on operational section. Using analysis of this section, the customers are clarified and it allows the focus of the organization would be on a particular section of customers (Bahrami *et al*., 2012).

3. Interactive CRM: in this kind of relationship, for establishing a relationship with the organization, customers uses the easiest method such as phone, mobile phone, fax, internet or other methods (Dillman *et al*., 2016). Due to the possibility of selecting the method by the customer and that most of the processes (from data collection to processing and referring customer) are reached to the related responsible bodies at the shortest possible time, interactive CRM gives rise to the repurchase of customer and continuance of relationship with the firm.

*Dimensions of CRM system*

In this paper, for examining and evaluating the performance of CRM system, the dimensions used in Öztays *et al.* (2011) study were used according to Table 1. Mehrabi *et al.* (2010) had carried out a study named an integrated pattern of implementing the concept of CRM in Mellat bank. The study offers an integrated pattern of implementing the concept of CRM in Mellat bank. The statistical population of this study consists of all the personnel of public relation of the Mellat bank in Tehran as well as its customers. The sampling didn't take place in this study, because the objective was examining CRM in the central building of Mellat bank. Therefore, the study had been done as a case study. Analysis had been done using inferential statistics and SPSS software. Distribution of frequency, central indexes and dispersion, Pearson correlation analysis and t test had been used for data analysis and Freedman test was used for variable ranking. Considering the data analysis, study results showed that organizational culture changes, technological changes and organizational structure changes have a significant positive effect on implementing effective CRM.

Doaei and Dabbaq (2010) studied CRM in governmental banks and financial entities, a comparison of CRM implementation in governmental banks and financial institutes. They have also investigated the relation between Human Resource Management (HRM) and CRM too. The data have been

Table 1: Criteria of dimensions and CRM criteria (Oztays *et al*., 2011)

| Dimension | Indexes and Criteria | References |
|---|---|---|
| Output dimension | Keeping customers, obtaining customers, share from portfolio | Reinartz *et al*. (2004), Richards and Jones (2008), Mägi (2003) |
| Process dimension | Customer goal setting, addressing management, customer knowledge production, campaign management, managing problems | Reinartz *et al*. (2004); Woodcock *et al*. (2003); Stefanou *et al*. (2003); Sin *et al*. (2005); Bueren *et al*. (2005); Lowenstein (1995); Li and Hu (2008) |
| Customer dimensions | Customer value, customer satisfaction, customer loyalty | Jones *et al*. (2005); Chen and Popovich (2003); Verhoef (2003); Winer (2001); Zikmund *et al*. (2003); Kim and Kim (2009); Buttle (2004); Tanner Jr *et al*. (2005) |
| Technological integration dimension | One to one relationship with potential customer, organization and infrastructure IT ability | Lindgreen *et al*. (2006); Ocker and Mudambi, (2003) |

collected from two questionnaires of measuring customer orientation of personnel and experts and measuring customer's satisfaction using random sampling. Based on study results, use of CRM in financial entities at significance level of 95% was greater than governmental banks.

The correlation coefficient between HRM and CRM suggested the strong and positive relation between these two themes. In comparing the level of satisfaction of customers and their tendency to putting a deposit in banks and financial entities, no significant difference had been found. On this basis, it is recommended that to enhance the culture of customer orientation, re-engineering, marketing studies, management of customer complaints together with suggestions for correcting human resource for recruitment, training, support and payment system must be considered.

Hamedi (2013) in his M.A. thesis titled examining the relation between organizational features on effective process of adopting CRM" has identified the relation of organizational features with CRM system with its processes in medical industries of Tehran. For doing so, the questionnaire has been completed in Tehran medical equipment firms, and one conducted appropriate statistical analysis to study the relation between features of organization, including (size, structure, strategy, maturity of information systems and support of senior management and product features) and features of system, including (data merge, skill, integration and system age) with effective process of adopting CRM including (perception, adopting and implementing CRM).

Analytical results show that among organization features, organization strategy, maturity of information system and support of senior management and among system features, data merge and integration of systems have the most significant relation at the process of adopting CRM. Kim and Kim (2009), in addition to evaluating the factors of success and failure of CRM, proposed a performance evaluation framework named as scorecard of CRM for recognizing and evaluating CRM performance of the firm. For finding a full set of CRM success factors and building a causative model, firstly a wide range of marketing literature, business strategy and information system are examined. Considerable factors have been classified into one of four various viewpoints namely infrastructure, process, customer and organizational performance, and they depicted in balanced scorecard. This primary model includes criteria that can specify the primary initiatives of implementing a CRM system. For prioritizing the factors, AHP technique has been used to evaluate the set of factors of each viewpoint.

Zeynep Ata and Toker (2012) have conducted the process of measuring CRM at three steps. Firstly, they examined the literature of CRM and identified and classified the factors affecting the CRM performance, which considered the factors through two viewpoints of infrastructure oriented (people, IT, organizational compatibility, CRM strategy) and output-oriented (economic effect, internal effect, marketing effect), and for each criterion, appropriate sub-criterion has been defined. Criteria and sub criteria have been evaluated based on AHP technic. In this study, in addition to evaluating the performance of CRM, one has paid attention for suggesting a solution for improving the weaknesses too.

Similarly, Alshavi *et al.* (2011) in their study named as studying organizational and technical factors and quality of data on adopting CRM in small and medium businesses, they trained the discussed subject. In this study, organizational factors include dimensions of advantages, information and communication technology (ICT) skills, organization size, budget and support of management, objectives and strategy of the business, supplier and customer, government and competitive pressure. Technical dimensions include purchase cost, criterion of selecting and evaluating software or system, complexity, ICT infrastructure, vendor support.

Data quality dimensions include infrastructure and quality of customer data, evaluating processes and tools of data quality, and classifies of customer data sources. The findings of this study confirm that the factors affecting the CRM adoption in small and medium businesses are extensively similar to factors affecting on CRM adopting in other organizations which previously have been examined by other researchers.

*Study Conceptual Model*

Finally, conceptual model of study relying on Oztays *et al.* (2011) is offered as shown in Fig. 1.

## MATERIALS AND METHODS

This study is a descriptive in terms of study data collection, because it describes the status quo of e-commerce and discusses the organization's performance in terms of CRM. Similarly, the study is practical by purpose, because with the use of a comprehensive pattern, tries to examine the performance of CRM in the organizations working in e-commerce, and finally, Using a combination of multi-criteria decision-making methods, including Network Analysis (ANP) and The Technique for Order of Preference by Similarity to Ideal Solution (TOPSIS) tries to offer a model for selecting the optimal choice in terms of performance. The study population consisted of experts who were familiar with marketing in e-commerce. In this regard, 12 recognized experts have participated in this research. To determine the weights of each identified variable, Network Analysis and Super Decision software have been used. Hierarchy of research is shown in Fig. 2.

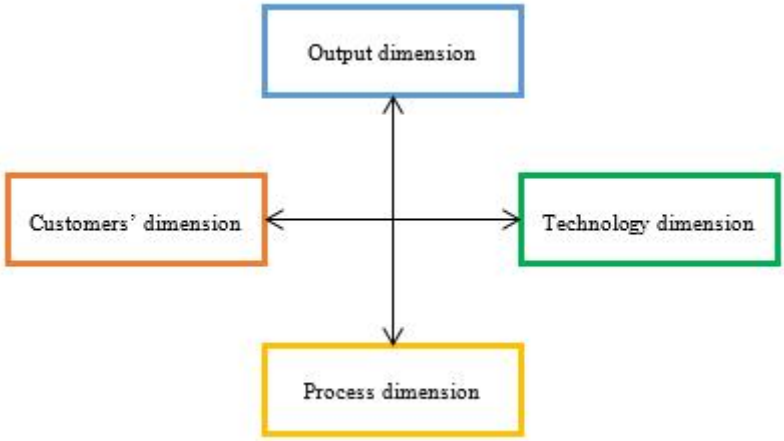



Fig. 1: The conceptual model of the study

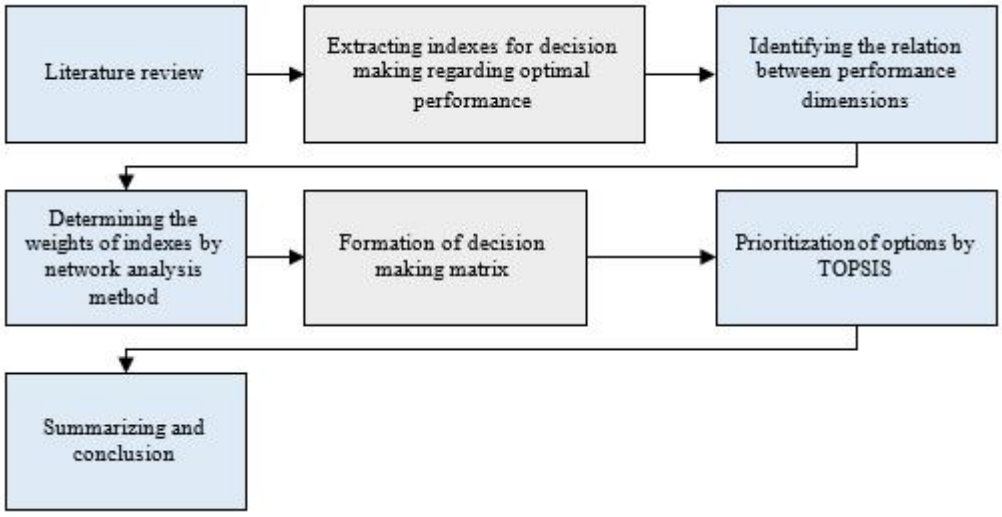



Fig. 2: Hierarchy of research

Two types of questionnaires have been used for data collection. General questions consisting, four questions relating to the demography of the respondents (Table 2).

Specialized questions: this section includes questions related to network analysis approach and TOPSIS analysis, which is offered in the form of a pairwise comparison matrix. Regarding determining the degree of importance of each identified factor by network analysis approach, a questionnaire with Likert scale has been devised in which, score 1 suggests the equal importance among studied factors and score 5 implies the degree of importance of a factor with regard to another one in a pairwise comparison. As for "customer" and "output" dimensions, the degree of importance of each of them is compared. All other pairwise comparisons are done on the same basis. Regarding the priority of options by TOPSIS approach, each one of three options are compared considering identified criteria in terms of degree of importance of allocating scores 1 to 5.

In this paper, for examining the validity and reliability of the questionnaire, Cronbach's alpha has been used. The value of validity has been calculated 0.795 based on collected data from the questionnaire that considering its greater value from 0.70 it implies the suitable reliability of questionnaire. Values of Cronbach's alpha for each dimension of model are offered as shown in Table 3.

In this paper, the two main sections of validity, i.e. content validity and face validity have been emphasized. In terms of content validity, the questionnaire main variables are completely extracted from the literature. In terms of face validity, the questionnaire used in this paper has been presented to three experts with higher education and several years experience and based on their views some improvements are made in the set-up of the questionnaire.

Table 2: Descriptive statistics of the respondents

| Description type | Range | Frequency |
|---|---|---|
| Age | 20 to 30 years old | 2 |
| | 31 to 40 years old | 6 |
| | 41 to 50 years old | 4 |
| Gender | Male | 8 |
| | Female | 4 |
| Educations | Bachelor | 1 |
| | Master of science | 4 |
| | Ph. D. | 7 |
| Organizational background | 5 to 10 years | 5 |
| | More than 10 years | 7 |

Table 3: Cronbach's alpha indexes value for model main dimensions

| Dimensions | Cronbach's Alpha index value |
|---|---|
| Customer | 0.81 |
| Output | 0.75 |
| Process | 0.82 |
| Technology | 0.79 |

## RESULTS AND DISCUSSION

After collecting questionnaires completed by experts and calculating their rate of inconsistency rate (less than 0.1), all the received questionnaires are involved in the calculations. As in the network analysis method one should address the internal relations between coplanar variables, for all identified factors, the matrix of internal relations has been calculated considering the type of relations shown in Fig. 1. A sample matrix of the internal relations of identified factors is shown in Table 4 with emphasis on customer dimension.

Finally, considering the pairwise comparison done on the each dimension, the final table is developed for weighting and priority of each one of identified dimensions in the paper as shown in Table 5.

As it is shown in the Table 5, output with 0.34 has greatest score and customer with 0.31 is at the second place, process with 0.18 is in third place and finally technology with 0.16 is at final rank. In the same way, one should examine the indexes of each dimension. Finally, the final table of dimension weights and discussed indexes in the model of study are shown in Table 6.

Among studies indexes, customer loyalty and customer preservation have the highest degree of importance and priority with respect to other indexes. Similarly, problem management and campaign management have the least degree of importance in terms of expert views.

In the following, one determines the weights of each one of identified dimensions using TOPSIS technic. A decision making matrix has been developed considering each one of studies firms in the study model. On this basis, in TOPSIS technic, one tries to prioritize each one of these firms considering identified resources and dimensions.

Step 1: Normalization (turning the existing decision making matrix to a normal decision making) of a decision making matrix $X = (X_{ij})_{n\times m}$ using the following equation. The Normalized matrix is shown in Table 7.

$$r_{ij} = \frac{x_{ij}}{\sqrt{\sum_{k=1}^{n} x_{kj}^2}} \qquad i = 1,\ldots,n; \quad j = 1,\ldots,m \tag{1}$$

Step 2: Calculating weighted normalized decision making matrix $V = (V_{ij})_{n\times m}$ (by assuming vector W as an input algorithm), (Table 8).

$$v_{ij} = w_j r_{ij} \qquad \sum_{i=1}^{m} w_j = 1 \qquad i = 1,\ldots,n; \quad j = 1,\ldots,m \tag{2}$$

j denotes the relative weight of the $w_j$ criterion.

$$v_{ij} = w_j r_{ij},\ V = (v_{ij})_{n\times m} \tag{3}$$

Table 9 suggests the normal weights of decision making matrix regarding each one of three studied firms. Topsis steps for positive and negative ideal solutions are as follows:

Step 3: Specifying the positive ideal solution and negative ideal solution:

Table 4: Matrix of internal relations with emphasis on customer dimension

| | Customer | Output | Process | Technology | Weights |
|---|---|---|---|---|---|
| Customer | 1.00 | 0.25 | 2.00 | 0.50 | 0.16 |
| Output | 4.00 | 1.00 | 4.00 | 0.25 | 0.39 |
| Process | 0.50 | 0.25 | 1.00 | 1.00 | 0.12 |
| Technology | 2.00 | 4.00 | 1.00 | 1.00 | 0.34 |

Table 5: Final matrix of model dimensions, weights

| | Customer | Output | Process | Technology | Weights |
|---|---|---|---|---|---|
| Customer | 0.16 | 0.24 | 0.41 | 0.43 | 0.31 |
| Output | 0.39 | 0.40 | 0.27 | 0.31 | 0.34 |
| Process | 0.12 | 0.25 | 0.22 | 0.15 | 0.18 |
| Technology | 0.34 | 0.11 | 0.11 | 0.11 | 0.16 |

$$A_w = \{\langle \max(v_{ij} | i=1,2,...,m) \mid j \in \Omega_- \rangle, \langle \min(v_{ij} | i=1,2,...,m) \mid j \in \Omega_+ \rangle\} \equiv \{v_w \mid j = 1, 2, \dots, n\}, \quad (4)$$

$$A_b = \{\langle \min(v_{ij} | i=1,2,...,m) \mid j \in \Omega_- \rangle, \langle \max(v_{ij} | i=1,2,...,m) \mid j \in \Omega_+ \rangle\} \equiv \{v_{bj} \mid j = 1, 2, \dots, n\}, \quad (5)$$

$\Omega_+$ denotes the set of criteria with the positive aspect (profit) and $\Omega_-$ stands for the set of criteria with the negative aspect (cost).

Using TOPSIS method and dimensions weights obtained from the previous model, the best positive ideal solution ($A_b$) and the worst one ($A_w$) are calculated (Table 10).

Step 4: Calculation Euclidean distances of each option from the positive and negative ideal solutions (Eqs. 6 and 7).

Euclidean distances of each option from the positive ideal solution ($A^b$) and negative ($A^w$) have been calculated (Table 11).

$$D_i^+ = \sqrt{\sum_{j=1}^{m} (v_{ij} - v_j^+)^2} \quad (6)$$

$$D_i^- = \sqrt{\sum_{j=1}^{m} (v_{ij} - v_j^-)^2} \quad (7)$$

Step 5: specifying the relative vicinity of each one of the options to the ideal solution: relation vicinity of option $A_i$ to $A^b$ is calculated as Eq. 8.

$$FC_i = \frac{D_i^-}{D_i^+ + D_i^-} \qquad i = 1, 2, ..., n \quad (8)$$

Table 6: Final table of dimension weights and discussed indexes in the model of study

| Main dimension | Main dimension weight | Index | Index weight | Final weight of index |
|---|---|---|---|---|
| Group I (customer) | 0.31 | Customer value | 0.11 | 0.033 |
| | | Customer satisfaction | 0.39 | 0.122 |
| | | Customer loyalty | 0.50 | 0.155 |
| Group II (output) | 0.34 | Customer preservation | 0.45 | 0.154 |
| | | Obtaining customer | 0.41 | 0.140 |
| | | Share from portfolio | 0.14 | 0.049 |
| Group III (process) | 0.18 | Customer goal setting | 0.34 | 0.062 |
| | | Addressing of management | 0.15 | 0.027 |
| | | Customer knowledge production | 0.32 | 0.059 |
| | | Campaign management | 0.09 | 0.017 |
| | | Problem management | 0.10 | 0.019 |
| Group IV (technology) | 0.16 | Individual relationship with potential customer | 0.33 | 0.061 |
| | | Organization and infrastructure information technology ability | 0.67 | 0.122 |

Table 7: Normalized matrix

| | Customer | Output | Process | Technology |
|---|---|---|---|---|
| Dijikala | 0.14 | 0.18 | 0.17 | 0.14 |
| Bamilo | 0.13 | 0.16 | 0.15 | 0.12 |
| Iranian | 0.09 | 0.14 | 0.14 | 0.10 |

Table 8: Weights of dimensions or criteria (W)

| Dimensions | Weights |
|---|---|
| Customer | 0.31 |
| Output | 0.34 |
| Process | 0.18 |
| Technology | 0.16 |

Table 9: Weighted normalized matrix

| | Customer | Output | Process | Technology |
|---|---|---|---|---|
| Dijikala | 0.043 | 0.061 | 0.031 | 0.022 |
| Bamilo | 0.040 | 0.054 | 0.027 | 0.019 |
| Iranian | 0.028 | 0.048 | 0.025 | 0.016 |

Table 10: Positive and negative ideal solutions.

| | Customer | Output | Process | Technology |
|---|---|---|---|---|
| Positive ideal solution ($A_b$) | 0.043 | 0.061 | 0.027 | 0.022 |
| Negative ideal solutions ($A_w$) | 0.028 | 0.048 | 0.025 | 0.016 |

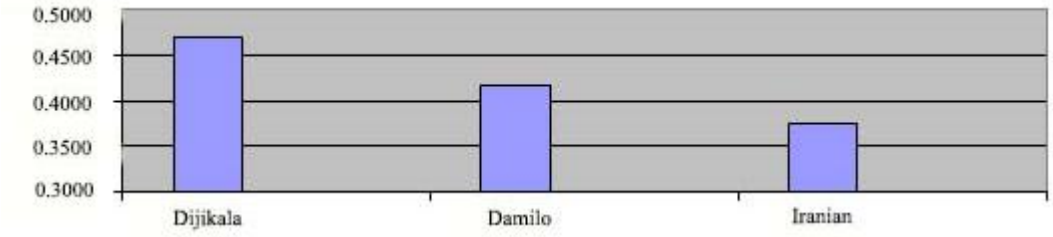
Table 11: Euclidean distances of each option from positive and negative ideal solution

| Evaluation indexes | $D_i^*$ | $D_i^-$ |
|---|---|---|
| Dijikala | 0.09 | 0.08 |
| Bamilo | 0.07 | 0.05 |
| Iranian | 0.05 | 0.03 |

Table 12: Results of final calculation

| Options | $D_i^*$ | $D_i^-$ | $FC_i$ |
|---|---|---|---|
| Dijikala | 0.09 | 0.08 | 0.4706 |
| Bamilo | 0.07 | 0.05 | 0.4167 |
| Iranian | 0.05 | 0.03 | 0.3750 |

Fig. 3: Ranking of Options




Vicinity to the ideal solution also has been determined based on the above formula, finally values of each option has been shown in Table 12 and Fig. 3 for final ranking.

Considering Table 12 as the final table, Dijikala has the best performance and Bamilo and Iranian are ranked at subsequent ranks in terms of performance.

## CONCLUSION

CRM is a multi-sectorial concept which all of organization units should be involved in it and support it, therefore it is not confined to the marketing or IT. Its goal is creating and acquiring stable and competitive advantages for organizations and added value for customers. Therefore, if the use of CRM in organizations fail to result in creation of added value for customers and competitive advantage for organizations, emphasis on implementing it in organizations leads to nothing except wasting resources and time. An effective CRM program comes with significant tangible outputs such as improving financial indexes (such as a reduction of cost or increase of sale and profit) as well as intangible criteria such as customer value, the image of the brand, progress in commercial processes and services and innovations. Considering the expansion of e-commerce firms and importance of CRM in this industry, organizations should analyze, monitor and manage the events deriving from e-commerce, and they should devise appropriate patterns for supervision of customers' performance. Besides, in recent times, complicated and dynamic competitive market require managers to do their best for attracting potential customers and retain the actual customers. Measuring the needs of customer and market and also establishing balance between these two can serve as a suitable solution for this. Finally, the study revealed the factors which are most important for evaluating the performance of customer relationship management. In this study, network analysis approach for prioritization of the dimensions and indexes involved in studying and evaluating CRM, as well as TOPSIS technique for using optimal option considering the discussed indexes were used. According to the results of this study and based on network analysis, among dimensions of implementing CRM, the output dimension has the highest weight in CRM. Output dimension includes sub indexes such as customer preservation, acquiring customers and share of customer portfolio. Among these dimensions, the index of customer preservation has the greatest effect on the evaluation of implementing CRM. Similarly, after output dimension, customer dimension includes customer value, customer satisfaction and loyalty which has the greatest effect

on CRM evaluation and among these sub-indexes, customer loyalty is the most influential on CRM evaluation. The point is that in a study which has been done by Ostays *et al*. (2011) based on comparing the performance of CRM in e-commerce firms in Turkey, it has been revealed that the output dimension is the most important in this evaluation and customer loyalty is the most significant index in CRM performance. Lo *et al*. (2010) in their study based on identifying factors affecting on the implementation of CRM, have noticed that customer loyalty and preservation have the highest effect on CRM performance. Kuada and Serles (2006) in their study based on CRM study in small and medium firms noticed that customer loyalty to the organization is among the important factors in CRM evaluation. Kim and Kim (2009) in their study have found that at evaluating the CRM system using balanced scorecard, the customer loyalty and output dimension are among most important factors. Shahraki (2009) in his M.Sc. dissertation on evaluating CRM. showed that the lack of customer satisfaction can cause the weakness of system and leaving the organization services.

In the following, some key results obtained from the study together with suggestions are presented:

Negotiating with customers and organization staff for the delivery of better services to customers for keeping their loyalty. Presenting profitable products which meet their expectations, change from product-orientation toward customer orientation, establishing long term and mutual relationship with interested people.

- Modeling customer satisfaction before implementation. Learning from mistakes and successes of efforts for future success.
- Automation of the decision making process and supervising on customer behavior change using intelligent factors for forecasting customer key behaviors.
- Using data mining processes for identifying customers behaviors and examining their loyalty to the organization.
- Using cluster analysis for discovering opinions of new customers and improving customer preservation through predictor models.
- Using experienced experts on customer orientation, use of the training course of CRM systems and understanding the culture of necessity of customer for the survival of the organization survival can play a great contribution for effective implementation of this system in CRM.
- Web sites serve as new tools along delivering services to customers and at each moment they can meet the customer needs with less cost, and to examine their views and to inform them. In spite of the importance of this tool in the customer knowledge acquisition, ease of design and lack of useful information in them, together with network problems cause that informing fails to take place with desirable speed.
- Customizing products results in acquiring a greater market share. In the context of e-commerce, customers can easily find their intended products by acquiring accurate information on the product or comparing with other similar products and to order the product with less cost and spending less time. Therefore, it recommends that these firms specialize their products and services to fit the customers.
- For keeping customers at long term, better support services should be offered to customers so that customers also raise their problems easily and supplier firms offer stronger support.

## ACKNOWLEDGEMENT

The author would like to extend his greatest appreciation to the IT experts of DigiKala, Bamilo and Iranian companies for sharing their experiences along with valuable feedback, tremendous *support* and endless encouragement.

## CONFLICT OF INTEREST

There are no conflicts of interest for publication of the manuscript.

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