Concurrent Evaluation of Customer Relationship Management and Organizational Excellence: An Empirical Study

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This article concurrently studies customer relationship management (CRM) and organizational excellence (OE) by pursuing three goals. First, it investigates the relationship between CRM and OE; second, it conducts a performance assessment from CRM and OE viewpoints; and third, it analyzes how each factor of CRM and each criterion of OE affects an organization's performance. To achieve the first goal, a number of hypotheses about potential relationships between CRM factors and OE criteria are proposed with the cooperation of experts and using fuzzy DEMATEL. These hypotheses are then examined using the path analysis method to find out which one is supported and which one must be rejected. Subsequently, the data envelopment analysis (DEA) approach is employed to accomplish the second goal. Finally, a t-test is used to achieve the third goal. To implement the research in the real world, two major international airports of Iran are considered as our survey cases.

In reviewing the history of marketing, it is clear that a paradigm shift has occurred over the past few decades. In the past, the goal of many firms was to achieve production efficiency by cutting operational costs per produced unit so as to sell products and deliver services at a lower price. Over the years, the transaction-based selling platform of mass marketing (i.e., the product-oriented view) proved to be unsustainable, because the strategies were easily imitated by competitors over a short period of time. Therefore, firms started focusing on the more relational-based approach of one-to-one marketing (i.e., the customer-oriented view) (Peppers, Rogers, & Dorf, 1999; Frow & Payne, 2009). This transition in marketing, which has been enabled by implementing customer relationship management (CRM) programs, puts more emphasis on involving customers in long-term relationships so that the firms can learn about customers' individual needs (Payne, Storbacka, Frow, & Knox, 2009; Peppers & Rogers, 2004), retain existing customers, and attract new customers by using value-creating activities.

Huge stresses of competition and survival around the world imposed by globalization have forced organizations to redesign themselves to realize excellence by means of creativity and innovation (Khandwalla & Mehta, 2004). An organization that seeks to achieve success must have a framework for conducting self-assessment. This process allows the organization to measure the situation it is in

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relative to its target excellence position and, by uncovering strengths and weaknesses, enables it to achieve better results. The two concepts of CRM and organizational excellence (OE) are discussed in the following subsections.

Customer Relationship Management

CRM gives organizations the knowledge to customize products that suit the individuals' needs on a one-to-one basis. During the past decades, CRM has proven to be a critical tool in increasing an organization's profitability by enabling it to identify the best customers and to satisfy their needs in an attempt to make them remain loyal to the organization (Thomas & Sullivan, 2005). Although CRM has been well accepted in the professional area, there is confusion about the definition of the term. Reviewing the CRM literature, Zablah, Bellenger, and Johnston (2004) discovered 45 distinct definitions of CRM. They conducted a thorough analysis of the identified conceptualizations to detect common elements and recurring themes among them. They eventually managed to classify the definitions into five categories as follows: (1) process (Reinartz, Kraft, & Hoyer, 2003), (2) strategy (Tan, Yen, & Fang, 2002), (3) philosophy (Hasan, 2003), (4) capability (Peppers et al., 1999), and (5) technology (Shoemaker, 2001).

Although CRM has been well accepted in the professional area, there is confusion about the definition of the term.

A number of studies have simultaneously stressed multiple perspectives (e.g., Kim, Suh, & Hwang, 2003). In general, CRM refers to a combination of business practices, strategies, and technologies that seeks to understand a company's customers from the perspective of who they are, what they do, and what they are like, in an effort to improve business relationships with customers, assist in customer retention, and drive sales growth. Payne and Frow (2005) defined CRM as a cross-functional organizational process that focuses on establishing, maintaining, and enhancing long-term relationships with attractive customers. According to Fickel (1999), CRM technology applications make a connection between front office (e.g., sales, marketing, and customer service) and back office (e.g., financial, operations, logistics, and human resources) via the company's customer touch points such as the Internet, email, direct mail, call centers, fax, and advertising.

Customer selectivity, as a significant feature of CRM, allows firms to distinguish their customers based on their needs, preferences, buying behavior, price sensitivity, and profitability (Storbacka, 2000). In addition, according to Gulati and Garino (1999), for customers, CRM offers customization, simplicity, and convenience for completing transactions, regardless of the channel used for interaction. Several studies on CRM have stated that many firms, in spite of spending billions of dollars, failed to effectively deploy and manage their CRM programs to achieve anticipated bottom-line improvement in business performance (see, e.g., Reinartz et al., 2004).

Numerous success factors (elements or processes) have been introduced for the evaluation of CRM performance (see, e.g., Alt & Puschmann, 2004; Chalmeta, 2006; Da Silva & Rahimi, 2007; King & Burgess, 2008; Mendoza, Marius, Pérez, & Grimán, 2007; Pan, Ryu, & Baik, 2007). However, not all these factors make sense in all types of organizations. In fact, to conduct a valuable analysis on an organization's CRM performance, the considered factors should make sense for that particular organization. This article focuses on the aviation industry. Two major international airports of Iran as the representatives of this important industry are considered as our survey cases. Because airports have face-to-face relationships with customers, they need a successful CRM program to gain customer satisfaction. Based on this choice (i.e., airports), seven factors of CRM have been selected from the literature that are almost general and could be meaningful in most cases.

1. **Top management commitment:** This factor shows management's willingness and devotion to invest and allocate resources for improving CRM programs as the same level as the other goals of the organization (Mendoza et al., 2007).
2. **Customer information management:** The information related to all customers should be collected and managed to be used for their segmentation as well as determining the lifetime values and suitable channels of communication (Öztaysi, Sezgin, & Özok, 2011).
3. **Technology-based CRM:** This factor is concerned with the application of computer technologies such as data storage, data mining, and CRM software systems to facilitate various CRM activities as well as actively offering technology assistance to customers (Sin, Tse, & Yim, 2005).
4. **Win-back management:** WBM relates to regaining interaction with lost or inactive customers, which requires proper customer information for customer analysis and targeting (Öztaysi et al., 2011).
5. **Culture:** One of the critical steps for meeting customers' expectations and achieving customer satisfaction, according to Christopher, Payne, and Ballantyne (2013), is to change from a product- or process-focused culture to a customer-focused culture.
6. **People:** People working at the organization should have market sensing as well as the capability and skill needed to understand customers and gain their trust and respect (Lindgreen, Palmer, Vanhamme, & Wouters, 2006).
7. **Organization:** The whole organization including top management, various departments, and, specifically, customer-facing employees must work together flawlessly and smoothly, support customer-oriented decision making, and have the flexibility to anticipate and respond to customer requests (Lindgreen et al., 2006).

Organizational Excellence

OE refers to the highest degree of performance (Antony & Bhattacharyya, 2010). Achieving excellence is largely dependent on the commitment and involvement of all the people within the organization, as well as the application of particular management tools, techniques, and practices (Rahman, 2004). A variety of OE models have been developed for this purpose among which the two models of the European Foundation for Quality Management (EFQM) and the Malcolm Baldrige have been widely implemented in a large number of organizations around the world. This article takes into account the EFQM criteria.

The EFQM excellence model, formed in 1988 by 14 leading European companies, is a framework that aims to evaluate organizations' achievements and progress toward excellence, to enhance awareness about the importance of quality and high performance, and to inspire firms toward competitiveness through continuous improvement and deployment of processes (Andersen, Lawrie, & Shulver, 2000). The model can be used in different ways: (1) as a diagnosis model for performing a self-assessment, (2) as a guide to identify areas for improvement, (3) as a way to benchmark with other organizations, (4) as a model for management control, and (5) as the basis for a common vocabulary and a way of thinking (EFQM, 2013). Among these applications, self-assessment has been the center of attention for both researchers and companies executing the model (Black & Crumley, 1997; Samuelsson & Nilsson, 2002), the obvious reason being that self-assessment enables organizations to recognize their strengths, weaknesses, and areas for improvement, as well as to attain more holistic visions by comparing their results with those of other organizations.

The EFQM model is composed of two equally considered categories—namely, enablers and results. The enablers indicate how the organization functions, and the results focus on the accomplishments for those who have an interest in the organization and how they can be measured and targeted (EFQM, 2013). Five enabler criteria are "leadership," "strategy," "people," "partnerships and resources," and "processes, products, and services"; and four results criteria are "customer results," "people results," "society results." and "key performance results". These criteria are defined as follows:

- **Leadership:** Leaders of excellent organizations are flexible. They imagine the future and make it happen, acting as role models for their values and ethics and inspiring trust at all times.
- **Strategy:** An excellent organization attempts to achieve its mission, vision, and values by establishing a stakeholder-focused strategy, and all its policies, plans, and activities are performed and deployed in the light of this strategy.
- **People:** An excellent organization makes the best use of its workers and motivates and rewards them to use their skills and knowledge for the benefit of the organization.

- **Partnerships and resources:** Excellent organizations plan and manage external partnerships, suppliers, and internal resources to realize effective operation of processes.
- **Processes, products, and services:** Excellent organizations design, manage, and improve processes, products, and services with the aim of generating acceptable value for all stakeholders, including customers.
- **Customer results:** Excellent organizations achieve outstanding results that meet or go beyond the needs and expectations of their customers and gain high levels of customer satisfaction.
- **People results:** Excellent organizations achieve outstanding results that meet or go beyond the needs and expectations of their people and attain high levels of people satisfaction.
- **Society results:** Excellent organizations achieve the best results for associated stakeholders within society.
- **Key performance results:** Excellent organizations achieve the key performance results committed to in their policy and strategy.

To sum up: CRM has been increasingly adopted as a key business practice, invested in profoundly by organizations. Indeed, it is widely recognized that execution of CRM results in improved customer satisfaction, reduced costs, and long-term profitability (Boulding, Staelin, Ehret, & Johnston, 2005). However, according to International Data Corporation and Gartner Group, the rate of successful CRM programs is below 30%, hardly justifying the cost of implementation (Lindgreen et al., 2006). This high rate of failure implies that CRM is mainly executed with a focus on a software package without an in-depth understanding of the issues of incorporating culture, people, process, and technology within and across the organization. Therefore, it is essential to assess the performance of the organization with respect to CRM to identify both its strengths and the areas for improvement and subsequently to decide objectively where to focus the improvement efforts. An excellence model's criteria are valuable for structuring a self-assessment to identify an organization's strengths and weaknesses.

Motivated by the significance of CRM and excellence models in organizations' competitiveness, this article aims to investigate these two concepts together. First, the relationship between different factors of CRM and criteria of OE is explored. Second, the performance of the organization from both CRM and OE perspectives is evaluated. Finally, the effect of each factor of CRM and each criterion of OE on organizational performance is analyzed statistically.

Literature Review

While numerous studies have tried to shed some light on the concept and features of CRM, the literature is inconsistent and highly fragmented due, in large part, to the lack of a common conceptualization. Focusing

on the literature about how organizations can successfully implement a CRM strategy, Finnegan and Currie (2010) developed a multilayered framework for mapping and understanding the interrelationships among complex variables associated with CRM implementation. Wang (2013) surveyed the implementation of CRM in hospital-based and privately run nursing homes in Taiwan. The obtained results showed that hospital-based nursing homes focused on different CRM activities from those of the privately run homes to build positive relationships with their residents. Fan and Ku (2010) aimed to examine the way knowledge sharing among members of firms' collaboration affects CRM profitability and formulated a CRM profitability model for this purpose. Rodriguez and Honeycutt Jr. (2011) examined the impact of CRM technology on the ability of business-to-business sales professionals to collaborate with internal stakeholders and evaluated the link between CRM utilization and sales performance.

Ernst, Hoyer, Krafft, and Krieger (2011) investigated CRM's potential to aid in future new product development, and presented a conceptual framework in which multiple facets of CRM were linked to new-product and company performance. Using an investigative study, Alshawi, Missi, and Irani (2011) aimed at identifying the organizational, technical, and data quality–related factors that affect CRM adoption by small and medium-sized enterprises (SMEs) so as to improve the quality of the evaluation process and help to support SMEs' decision makers in exploring potential effects on CRM adoption. Wang (2012) discussed the compatibility between CRM and revenue management and studied possible management conflicts that could happen from both account managers' and revenue managers' points of view. Chang, Wong, and Fang (2014) examined the impact of the completeness of CRM relational information processes on customer-based relational performance and profit performance. Ku (2010) formulated the model of CRM profitability by relationship marketing from a system-efficiency perspective. Also, using structural equation modeling (SEM) analysis, he showed that CRM profitability is dependent not only on the quality of information systems but on service orientation and service processes.

There has been an increasing interest among researchers in the theory and application of different excellence models, including the EFQM and Malcolm Baldrige in the past decade (see, e.g., Araújo & Sampaio, 2014; Asif, Raouf, & Searcy, 2013; Calvo-Mora, Navarro-García, & Periañez-Cristobal, 2015; Hakkak & Ghodsi, 2015; Heras-Saizarbitoria, Marimon, & Casadesús, 2012; Link & Scott, 2012; Sampaio, Saraiva, & Monteiro, 2012; Talwar, 2011). Eszter Tóth and Jónás (2012) investigated the way the EFQM excellence model and organizations' self-assessment practice could aid in the managerial and quantification efforts of intellectual capital. In an empirical study, Zad, Sekkeh, and Asadi (2013) examined the relationship between emotional intelligence and OE, based on the EFQM model in physical education offices and sport committees of Northern Khorasan province. Harrington and Voehl (2013) analyzed innovation management, emphasized its significance as a key operational discipline,

and introduced it as a critical tool to achieve OE. Tutuncu and Kucukusta (2007) studied the relationship between organizational commitment and the EFQM business excellence model and examined their theory on Turkish quality-award winners. The results indicated the significant relationship of these two concepts. In another paper, Tutuncu and Kucukusta (2010), using canonical correlation analysis, showed that there is a strong relationship between the EFQM excellence model and job satisfaction. Jacobs and Suckling (2007) aimed to show how to utilize the concepts of the EFQM excellence model to effectively self-assess critical performance issues associated with customer focus. Doeleman, Ten Have, and Ahaus (2014) provided a review of the literature on empirical evidence that performance is enhanced through interventions in the criteria of the EFQM excellence model and found that the evidence was mainly restricted to descriptive research and to studies that lack control groups.

Prybutok, Zhang, and Peak (2011) examined whether the Malcolm Baldrige National Quality Award Program (MBNQA) 2002 criteria were applicable to governmental organizations and aimed to provide support for the application of the model to government services in a municipal government. Beard and Humphrey (2014) proposed the application of a balanced scorecard approach based on the performance criteria of the MBNQA to evaluate the resources of information technology in higher education institutions. He, Hill, Wang, and Yue (2011) developed a measurement model bonded with Baldrige criteria at both construct and dimension levels, and then, using evidence from China, aimed to validate the theoretical model underlying the Baldrige framework. Focusing on the significance of the innovation in health systems achieving excellence, Duarte, Goodson, and Dougherty (2014) used a framework based on health care criteria for performance excellence to identify the key practices in innovation as established by the 15 Baldrige winners. The results showed that innovation was incorporated into the organizations' vision, mission, and values statements and was explicitly supported by senior leadership.

Besides other goals, all organizations seek to achieve continuous improvement, customer satisfaction, commitment, and leadership on the part of top management along with contribution and support on the part of employees and teamwork. The EFQM model and the relevant self-assessment procedure have given new direction to the quality movement and have driven considerable improvement into participating organizations (Dale, Zairi, Van der Wiele, & Williams, 2000). Another success key for an organization is a perfect CRM program, which helps achieve improvement in efficiency; improved profitability; reduction in costs; increase in sales; and enhanced customer value, customer satisfaction, and loyalty (Ko, Kim, Kim, & Woo, 2008; Reinartz, Krafft, & Hoyer, 2004; Richard, Thirkell, & Huff, 2007).

But are the two concepts of CRM and OE linked with each other? In other words, can an appropriate CRM program help achieve excellence? Can excellence criteria affect CRM's success? Do organizations with a successful CRM implementation function suitably in terms of

excellence criteria as well? Reviewing the literature shows that despite numerous studies on CRM and OE, these two concepts have not been studied together. This article aims to fill this gap by focusing on three goals; first, it investigates the relationship between CRM and OE. For this purpose, experts' opinions, fuzzy DEMATEL, and path analysis are used to examine the way each factor of CRM affects each OE criterion and vice versa. Second, the performance of the organization from CRM and OE viewpoints is evaluated by using a data-envelopment analysis (DEA) approach. Finally, how each factor of CRM and each criterion of OE affects the organization's performance is analyzed statistically.

The plan for the remainder of the discussion is as follows. A step-by-step explanation of the methodology is provided in the section on methodology. The applicability of the framework is demonstrated in the following section by employing it in a real-world case study. The section that follows is dedicated to the concluding remarks and the limitations of the study. Some directions for future research are given in the final section.

Methodology

The methodology employed to achieve the goals of this study as well as a brief introduction to the required tools are presented in this section.

Collecting the Required Data

The first step is to collect the data related to each factor of CRM and OE. For this purpose, two separate standard questionnaires containing questions regarding the factors of CRM and criteria of OE were designed and then distributed among the staff of the organization.

Examining the Reliability and Validity of the Data

After the required data were collected, their reliability and validity were examined using Cronbach's alpha and factor analysis, respectively. The reliability test evaluates the capability of the questionnaire to yield the same results on various situations, whereas validity is the ability of an instrument to measure what it is supposed to measure.

Once the reliability and validity of the data have been confirmed, fuzzy DEMATEL, path analysis, and DEA are employed to achieve the goals of the study. What follows is an introduction to fuzzy DEMATEL, path analysis, and DEA as well as the explanation of how to analyze the effects of factors on the performance.

Fuzzy DEMATEL

Decision making trial and evaluation laboratory (DEMATEL), first put forward by Gabus and Fontela (1972, 1973), is a method for building and analyzing a structure involving causal relationships between complex factors (Dalalah, Hayajneh, & Batieha, 2011). Based on directed graphs

(also known as digraphs) to categorize factors into cause-and-effect groups, DEMATEL enables analyzing and solving problems by visually presenting the interdependence relationships and determining the values of influential effects between factors. The DEMATEL method has recently become popular because of its ability to pragmatically visualize complicated causal relationships. Given that people's judgments and perceptions on decision factors are usually presented subjectively and thus are difficult to express in exact numerical values (Wu & Lee, 2007), fuzzy logic was incorporated into DEMATEL, and fuzzy DEMATEL was developed. The steps of conducting fuzzy DEMATEL are as follows (Chen-Yi, Ke-Ting, & Gwo-Hshiung, 2007):

Step 1. Define the goal and choose a committee of experts with H members who are knowledgeable about this issue.

Step 2. Ask the committee members to develop suitable criteria and design the fuzzy linguistic scale. Using linguistic terms, each expert should make pairwise comparisons between the factors about the magnitude of influence they have on each other. Table 1 presents available linguistic terms that each expert can use along with the corresponding assigned triangular fuzzy numbers.

Step 3. Acquire a fuzzy direct-relation matrix. Assume there are n criteria, and $\tilde{x}_{ij}^{k} = (l_{ij}^{k}, m_{ij}^{k}, u_{ij}^{k})$ denotes the degree to which criterion i influences criterion j in expert k's opinion. The initial $n \times n$ fuzzy direct-relation matrix $\tilde{A}$ is calculated as follows:

$$\tilde{A} = [\tilde{a}_{ij}]_{n\times n} = \frac{1}{H}(\tilde{X}^{1} \oplus \tilde{X}^{2} \oplus \ldots \oplus \tilde{X}^{H})$$

where H represents the number of experts and $\tilde{a}_{ij} = (l_{ij}, m_{ij}, u_{ij})$ shows the degree to which criterion i affects criterion j based on the experts' judgments. Note that, without loss of generality, in this matrix, $\tilde{a}_{ij} = (0,0,0)$, $\forall i$.

Step 4. Obtain a normalized fuzzy direct-relation matrix. The normalized fuzzy direct-relation matrix $\tilde{D}$ is acquired as follows:

$$\tilde{D} = \begin{bmatrix} \tilde{d}_{11} & \tilde{d}_{12} & \ldots & \tilde{d}_{1n} \\ \tilde{d}_{21} & \tilde{d}_{22} & \ldots & \tilde{d}_{2n} \\ \vdots & \vdots & \ddots & \vdots \\ \tilde{d}_{n1} & \tilde{d}_{n2} & \ldots & \tilde{d}_{nn} \end{bmatrix}$$

TABLE 1 LINGUISTIC TERMS AND THE CORRESPONDING TRIANGULAR FUZZY NUMBERS

LINGUISTIC T-TERM	TRIANGULAR FUZZY NUMBER
Very high influence	(0.75, 1, 1)
High influence	(0.5, 0.75, 1)
Low influence	(0.25, 0.5, 0.75)
Very low influence	(0, 0.25, 0.5)
No influence	(0, 0, 0.25)

where

$$\tilde{d}_{ij} = \frac{\tilde{a}_{ij}}{s} = (\frac{l_{ij}}{s}, \frac{m_{ij}}{s}, \frac{u_{ij}}{s})$$

and

$$s = \max_{1 \le i \le n} \left(\sum_{j=1}^{n} u_{ij} \right)$$

Step 5. Obtain a fuzzy total-relation matrix. In this step, the following formula is used to obtain the fuzzy total-relation matrix $\tilde{T}$:

$$\tilde{T} = \lim_{k \to \infty} \left(\tilde{D}^1 + \tilde{D}^2 + \ldots + \tilde{D}^k \right)$$

$$\tilde{T} = \lim_{k \to \infty} \left(\tilde{D}^1 + \tilde{D}^2 + \ldots + \tilde{D}^k \right)$$

Assume

$$\tilde{T} = \begin{bmatrix} \tilde{t}_{11} & \tilde{t}_{12} & \ldots & \tilde{t}_{1n} \\ \tilde{t}_{21} & \tilde{t}_{22} & \ldots & \tilde{t}_{2n} \\ \vdots & \vdots & \ddots & \vdots \\ \tilde{t}_{n1} & \tilde{t}_{n2} & \ldots & \tilde{t}_{nn} \end{bmatrix}$$

where $\tilde{t}_{ij} = (l'_{ij},\ m'_{ij},\ u'_{ij})$. We have:

$$\left[l'_{ij} \right] = \tilde{D}_l (I - \tilde{D}_l)^{-1}$$
$$\left[m'_{ij} \right] = \tilde{D}_m (I - \tilde{D}_m)^{-1}$$
$$\left[u'_{ij} \right] = \tilde{D}_u (I - \tilde{D}_u)^{-1}$$

where I represents the identity matrix.

Step 6. Perform defuzzification. In this step, to obtain the total-relation matrix T with crisp elements, the fuzzy numbers of the fuzzy total-relation matrix $\tilde{T}$ are difuzzified by the following equation:

$$t_{ij} = \frac{\left[\left(u'_{ij} - l'_{ij} \right) + \left(m'_{ij} - l'_{ij} \right) \right]}{3} + l'_{ij}$$

Therefore, we have

$$T = \left[t_{ij} \right],\ i, j = 1, 2, \ldots,\ n$$

Step 7. Compute the sums of rows and columns to obtain the causal diagram as follows:

$$R = (r_i)_{n \times 1} = \left[\sum_{j=1}^{n} t_{ij} \right]_{n \times 1}$$

$$C = (c_j)_{n \times 1} = (c_j)'_{1 \times n} = \left[\sum_{i=1}^{n} t_{ij} \right]'_{1 \times n}$$

where R and C indicate the sum of rows and sum of columns, respectively. A cause and effect graph can be depicted by mapping the data set of $(R + C, R - C)$.

Path Analysis

Path analysis, developed by geneticist Sewall Wright (1921), which is typically considered as an extension of the multiple regression model, is a special case of SEM used to describe the directed dependencies between a set of variables. This approach is used to determine whether or not a multivariate set of non-experimental data fits well with a particular (a priori) causal model (Wright, 1934). Path analysis is similar to traditional methods such as correlation and regression from many aspects. For example, both regression and path analysis are on the basis of linear statistical models, and statistical tests related to both methods are valid as long as certain assumptions are satisfied. There are, however, several differences between the two methods. For example, contrary to regression analysis, in which variables are either independent or dependent, in path analysis variables could be independent (exogenous) and dependent (endogenous) at the same time (Loehlin, 2004).

Path analysis attempts to provide estimates of the magnitude and importance of hypothesized causal relationships between a set of variables, which is explained by depicting a path diagram (Schumacker & Lomax, 2004). The path diagram is then transformed into a set of equations, which are solved simultaneously to test model fit and estimate parameters. To construct a path diagram, we simply write the names of the variables and draw an arrow from each variable to any other variable we believe that it affects. A single-headed arrow shows the effect of an exogenous or intermediate variable on an endogenous variable, and a double-headed arrow shows the covariance between two exogenous variables.

Two types of effects are defined in the path mode—namely, direct effect and indirect effect. If an arrow is drawn from an exogenous variable toward an endogenous variable, it is said to be the direct effect. However, the effect of an exogenous variable through an intermediate variable, called the mediator, represents an indirect effect. The sum of direct and indirect effects accounts for the total effect of the exogenous variable.

The direct effect of an exogenous variable on an endogenous variable is known as path coefficient, which is equal to standardized regression coefficient (Schumacker & Lomax, 2004). Path coefficients are not correlation coefficients. A path coefficient $\beta = 0.78$ means if exogenous variable increases by one standard deviation from its mean, the endogenous variable would be expected to increase by 0.78, its own standard deviation from its own mean while holding all other relevant regional connections constant. A simple example of a path diagram is depicted in Figure 1.

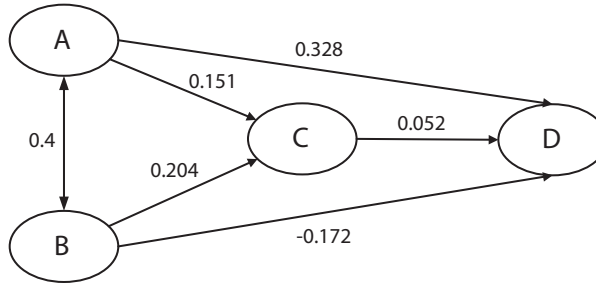

FIGURE 1. AN EXAMPLE OF A PATH DIAGRAM

In this diagram, each oval represents a variable; "A" and "B" are exogenous variables whose variances are assumed to be caused entirely by variables not involved in the model, while "C" and "D" are endogenous variables whose variances are assumed to be explained by other variables in the model. The value 0.4 between A and B represents the covariance between them, and all the values are path coefficients.

Data Envelopment Analysis

DEA, first developed by Charnes, Cooper, and Rhodes (1978), is a linear nonparametric model used to evaluate the performance of a set of peer entities called DMUs, which convert multiple inputs into multiple outputs by measuring their relative efficiency scores. DEA establishes a frontier that distinguishes efficient DMUs from inefficient ones. To put it precisely, the DMUs that lie on the frontier are recognized as efficient, while those enveloped by the frontier (i.e., fall below the frontier) are declared inefficient. DEA measures the efficiency of a DMU relative to all other DMUs with the limitation that all DMUs lie on or below the frontier. The scores are typically expressed as a number between 0 and 1. Efficient DMUs take the score 1, and a score less than 1 goes to each of the inefficient ones. Andersen and Petersen (1993) relaxed this constraint to allow the scores to exceed the maximum value 1 and achieved full ranking by sorting efficient DMUs.

The CCR model, as the classic DEA model presented by Charnes et al. (1978), has an assumption of constant returns to scale for the inputs and outputs in which the output changes proportionally to the input. Banker, Charnes, and Cooper (1984) developed the BCC model that considers variable returns to scale in which a change in the input leads to a disproportional change in the output. This model evaluates whether increasing, constant, or decreasing returns to scale would enhance the observed efficiency. According to Banker (1984), an advantage of DEA is that no a priori structure is imposed on the data in determining the efficient units. Further details on DEA can be found in several studies such as those by Charnes, Cooper, Lewin, and Seiford (2013); Cook, Cooper, Seiford, and Tone (2001); and Shafer and Byrd (2000).

Sarkis (2000) suggests using CCR and BCC models simultaneously for two reasons: (1) it allows determination of the overall technical and scale efficiencies of the DMUs, and (2) it helps detect whether the data show constant or varying returns to scale. Therefore, in this study, both deterministic and fuzzy BCC and CCR models in the forms of input- and output-oriented are used to compute the scores of the DMUs. The aim is to find out whether the choice of DEA model significantly affects estimated average scores (Mostafa, 2009). Subsequently, Spearman's rank-order correlation coefficient is determined among all pairs of the rankings obtained by DEA models. If the null hypothesis is rejected for all cases with a positive large correlation coefficient, it can be concluded that different DEA models yield consistent results and the choice of DEA model does not affect average score. To select a single DEA model to calculate the scores as well as to achieve more reliable results, a noise test is conducted through which the DEA model with the highest resistance to noise is selected as the optimum DEA model. For this purpose, a noise is inserted into the data set and Spearman's correlation coefficient is computed for each model between the results obtained before noise insertion and those afterwards. The DEA model with the highest coefficient is the most resistant model to noise and thus is selected as the optimum model.

Analysis of the Factors' Effects on the Performance

This part of the study provides the company's management with worthwhile results. The aim of this step is to find out how each factor of CRM and OE affects the organization's performance. If the effect of a factor proves to be positive, the factor has been implemented in the organization appropriately, whereas a negative effect of a factor implies that it has been executed unsuitably. There could be factors that prove to be ineffective, indicating that their impact on the improvement or deterioration of performance is not considerable.

For this purpose, each factor is excluded from the calculations, the scores of the DMUs are computed anew by the optimum DEA, and the results are compared to those obtained in the presence of the factor by paired t-test. The hypotheses of this test are as follows:

$$\begin{cases} H_0 : \mu_F = \mu_i \\ H_1 : \mu_F \neq \mu_i \end{cases}$$

where μ_F and μ_i denote the mean score before and after the elimination of factor i. If there is no statistically significant reason to reject the null hypothesis, it can be concluded that the factor is ineffective, meaning that it does not affect the performance considerably. In contrast, rejection of the null hypothesis implies that the factor is influencing, in which case it should be determined whether the factor affects the performance positively or negatively. To do so, a one-tailed t-test is used to find out whether $\mu_F > \mu_i$ or $\mu_F < \mu_i$. For factor i, if $\mu_F > \mu_i$ is supported,

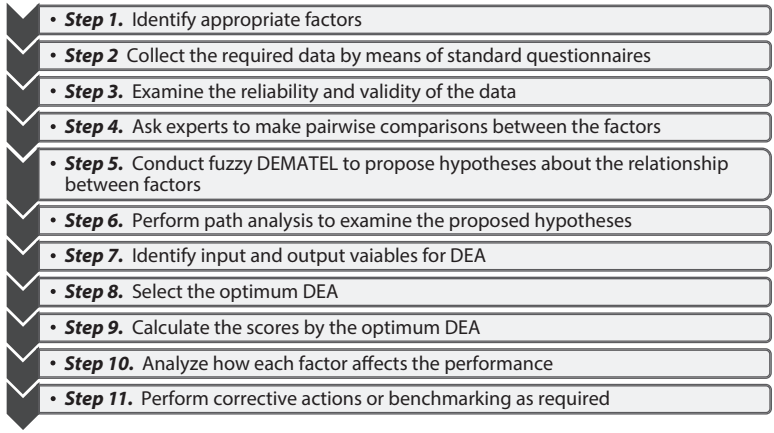

FIGURE 2. OVERVIEW OF THE METHODOLOGY

this shows that the average score has decreased after the elimination of the factor and thus the factor is positive. Also, $\mu_F < \mu_i$ indicates that the removal of the factor increases the mean score and therefore the factor is negative.

Implementation of Corrective Actions and Benchmarking

Once unsuitably implemented factors have been identified, the organization should try its best to find appropriate solutions to resolve the problem and take corrective actions as required. Furthermore, positive factors could be used for benchmarking. The steps of the methodology are summarized in Figure 2.

Case Study

In this section, to demonstrate the applicability of the presented framework, it is applied to two major international airports of Iran—namely Mehrabad and Emam Khomeini as the representatives of the Iranian aviation industry. Airports, due to their face-to-face relationship with customers, try to gain customer satisfaction and thus need an appropriate CRM program. As with all other organizations, it is the airports' final goal to achieve excellence. Therefore, it is of high importance to realize how CRM and OE work together in the aviation industry. The way of implementing the methodology as well as the obtained results are presented step by step in the following subsections.

Data Collection and Sample Characteristics

As mentioned previously, the first step is to collect the required data. For this purpose, standard questionnaires were designed based on the

considered CRM factors and OE criteria (introduced in the first section). The respondents were asked to respond on a uniform five-point Likert scale ranging from "strongly agree" to "strongly disagree." Examples of the questions asked from the respondents are presented in Appendix I. Once the content validity was confirmed by experts, the questionnaires were distributed among 80 people working in different units of either of the airports such as check-in, arrivals, departures, and the control tower. Three and five questionnaires related to Mehrabad and Emam Khomeini, respectively, were excluded due to missing values. The demographic features of the respondents are summarized in Table 2 for both of the airports.

Reliability and Validity Tests

Having collected the required data, the next step is to examine the reliability and validity of the data by Cronbach's alpha and factor analysis, respectively. The lowest acceptable value for Cronbach's alpha is 0.7 (Dörnyei, 2007). The results are given in Table I in Appendix II, according to which both reliability and validity are supported.

Common Method Variance

When data on two or more constructs are collected at the same time from the same participants, common method variance (CMV) may be

TABLE 2 DEMOGRAPHICS OF THE SAMPLES

	FREQUENCY (PERCENTAGE)	
CHARACTERISTIC	**MEHRABAD**	**EMAM KHOMEINI**
Age (years)		
≤30	15 (19.5)	17 (22.7)
31–45	32 (41.5)	35 (46.7)
46–55	23 (30)	18 (24)
≥56	7 (9)	5 (6.6)
Gender		
Male	41 (53.2)	46 (61.3)
Female	36 (46.8)	29 (38.7)
Work experience (years)		
≤5	10 (13)	9 (12)
6–10	15 (19.5)	11 (14.7)
11–20	33 (42.8)	37 (49.3)
21–30	19 (24.7)	18 (24)
Education		
High school graduate	8 (10.4)	6 (8)
Bachelor's degree	56 (72.7)	51 (68)
Master's degree	13 (16.9)	18 (24)

a concern (Podsakoff & Organ, 1986). CMV generates a false internal consistency (i.e., an apparent correlation between variables created by their common source) (Podsakoff, MacKenzie, Lee, & Podsakoff, 2003). There are several statistical approaches to detect and control for any possible CMV. In this article, Harman's single-factor test is used to examine whether variance in the data can be mainly attributed to a single factor. The results of this test revealed that no single, general factor was extracted (Podsakoff & Organ, 1986), and thus it can be concluded that CMV does not have a substantial effect on the study findings.

Examining the Relationship between CRM and OE

The next step is to determine the relationship between different factors of CRM and OE. For this purpose, two academic experts and three experts from either of the airports were asked to make pairwise comparisons between the factors using the linguistic statements given in Table 1. The experts' opinions are then inserted into fuzzy DEMATEL and potential relationships (i.e., hypotheses) are identified. Note that because the first goal of this article is to evaluate the relationship between CRM and OE in Iran's aviation industry, the data collected from the two airports are not separated but are considered together (i.e., 152 DMUs) for the analysis. The hypotheses yielded by fuzzy DEMATEL are as follows:

Hs 1–9: "Top management commitment" positively affects all OE criteria.
Hs 10–16: "Leadership" positively affects all CRM factors.
Hs 17–20: "Customer information management" positively affects "processes, products and services," "customer results," "society results" and "key performance results."
Hs 21–24: "Technology-based CRM" positively affects "processes, products and services," "customer results," "society results," and "key performance results."
Hs 25–27: "Win-back management" positively affects "customer results," "society results," and "key performance results."
Hs 28–36: "Culture" positively affects all OE criteria.
Hs 37–42: "People" (CRM) positively affects "people" (OE), "processes, products, and services," "customer results," "people results," "society results," and "key performance results."
Hs 43–48: "Organization" positively affects "people" (OE), "processes, products, and services," "customer results," "people results," "society results," and "key performance results."
Hs 49 and 50: "Strategy" positively affects "customer information management" and "technology-based CRM."
Hs 51 and 52: "People" (OE) positively affects "people" (CRM) and "organization."

Once potential relationships have been identified, path analysis is conducted to evaluate the suitability of the theoretical model under

analysis according to the empirical data to find out which of the hypotheses are supported and which must be rejected. In this paper, we use AMOS 22 to perform path analysis.

Before analyzing the results of path analysis, confirmatory factor analysis is conducted to determine the validity of the structural model. For this purpose, it is essential to calculate some fitness indicators to test whether the measurement model fits the data well. In addition, construct validity, which is composed of convergent validity and discriminant validity, must be examined. Convergent validity assesses the level of correlation between two measures of a single factor whereas discriminant validity is the degree of distinction between two factors that are conceptually similar (Hair, Black, Babin, & Anderson, 2010). Convergent validity can be evaluated by computing average variance extracted (AVE) for each factor (construct) as follows:

$$AVE = \frac{\sum_{i=1}^{n} \lambda_i^2}{n}$$

where λ denotes standardized factor loading and i represents the number of items. AVE values greater than 0.5 for all the factors confirm convergent validity (Hair et al., 2010).

In relation to discriminant validity, if variance-extracted percentages for any two factors have values higher than the square of the correlation between those factors, discriminant validity is confirmed (Hair et al., 2010).

Critical fit measures together with the obtained results for them are provided in Table 3. The results of convergent validity, which are presented in Table I in Appendix II, and discriminant validity, which are not given here for the sake of brevity, support both tests.

Once the goodness-of-fit, convergent validity, and discriminant validity of the hypothesized model have been confirmed, path analysis is carried out. Figure 3 depicts the obtained diagram. The results show that at the significance level of $\alpha = 0.05$, out of 52 hypotheses, 47 hypotheses are supported, while the remaining 5 are rejected. To prevent confusion, only the path coefficients related to the rejected hypotheses are highlighted in the figure.

TABLE 3 GOODNESS-OF-FIT INDICATORS

MEASURE	VALUE	RECOMMENDED VALUE
CFI	0.921	≥ 0.9
GFI	0.918	≥ 0.9
AGFI	0.933	≥ 0.9
χ^2/df	1.76	≤ 3
RMSEA	0.046	≤ 0.08

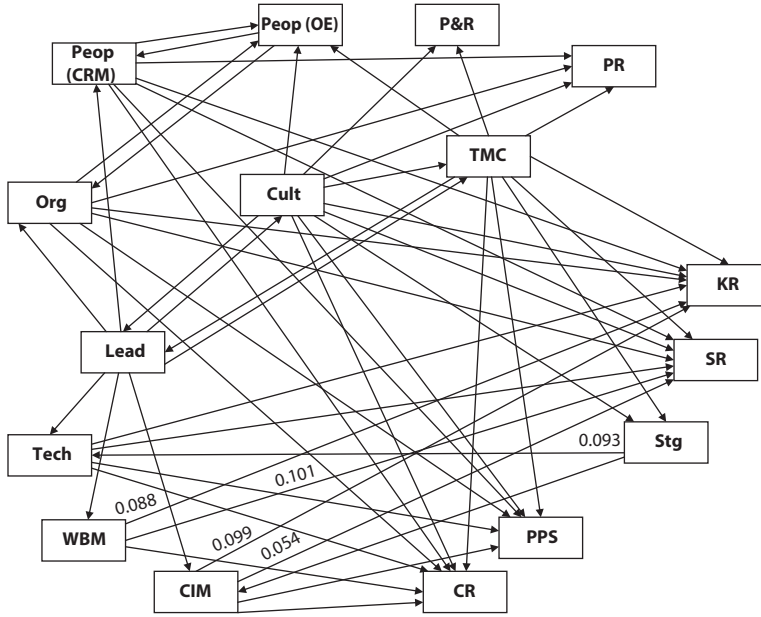

FIGURE 3. PATH ANALYSIS RESULTS

Note. **TMC:** top management commitment; **CIM:** customer information management; **Tech:** technology-based CRM; **WBM:** win-back management; **Cult:** culture:; **Peop (CRM):** people (CRM); **Org:** organization; **Lead:** leadership; **Stg:** strategy; **Peop (OE):** people (OE); **P&R:** partnerships and resources; **PPS:** processes, products, and services; **CR:** customer results; **PR:** people results; **SR:** society results; **KR:** key performance results.

As shown in Figure 3, the following hypotheses have been rejected at the significance level of $\alpha = 0.05$:

- "Strategy" positively affects "technology-based CRM."
- "Win-back management" positively affects "society results."
- "Win-back management" positively affects "key performance results."
- "Customer information management" positively affects "society results."
- "Customer information management" positively affects "key performance results."

Using these results, the organization understands that investment in a specific factor (e.g., factor A) not only improves factor A but also positively affects all other factors that are somehow connected to factor A. In addition, if an organization is unable to influence factor A using the results obtained by path analysis, it can act indirectly, meaning that the organization attempts to improve all the factors that are connected

to factor A and in this way influence factor A. For example, in our case, improvement in "technology-based CRM" positively affects "customer results." This indicates that one of the ways to enhance customer satisfaction is to provide customers with user-friendly equipment to communicate with the airport as easily and comfortably as possible.

Performance Assessment from CRM and OE Viewpoints

In this step, the performance of the two airports is assessed separately from the perspectives of CRM and OE by means of the DEA approach developed by Andersen and Petersen (1993). The first step is to select input and output variables. Because all the factors of CRM and OE are of positive nature, meaning that their maximization is desired in an optimization model such as DEA, they are all considered as the output variables of the DEA and a dummy variable that considers a 1 for each DMU is taken as the input.

The next step is to examine whether the considered inputs and outputs satisfy the condition that increasing amounts of inputs lead to increasing outputs. The isotonicity test developed by Avkiran (1999) is employed for this purpose. This test involves the calculation of all intercorrelations between inputs and outputs. In our case, because there are no input variables, this test is not applicable.

According to Berg (2010), outliers in the data set can cause substantial distortions in the DEA results. Therefore, the presence of outliers is investigated by means of the box plot. According to the plots, no outlier is noticed; thus, all DMUs are included in the analysis.

In this step, the optimum DEA model, which is definitely in the form of output-oriented, is selected. For conducting the noise test explained in the previous section, output-oriented BCC FDEA with $\alpha = 0.9$ and output-oriented BCC FDEA with $\alpha = 0.85$ are selected as the optimum models for Mehrabad and Emam Khomeini, respectively. The scores obtained by the optimum DEA models are considered as the final scores. These scores show the staff's overall opinions about how successful either of the airports has been in implementation of CRM and achieving OE. A higher average score represents higher success in executing CRM programs and reaching OE in staff's opinions. The results (i.e., scores) related to CRM obtained by the optimum DEA models for the Mehrabad and Emam Khomeini airports are presented graphically in Figures 4 and 5, respectively. Descriptive statistics related to CRM and OE for these two cases are given in Table 4.

Once the efficiency scores from the CRM and OE points of view have been calculated for the two airports, it is worthwhile to make a comparison between the two cases to find out whether either of them functions more appropriately than the other one. Although the results given in Table 4 indicate that, for example, Mehrabad's average efficiency score from CRM standpoint is higher than that of Emam Khomeini, it cannot be concluded that Mehrabad functions much better

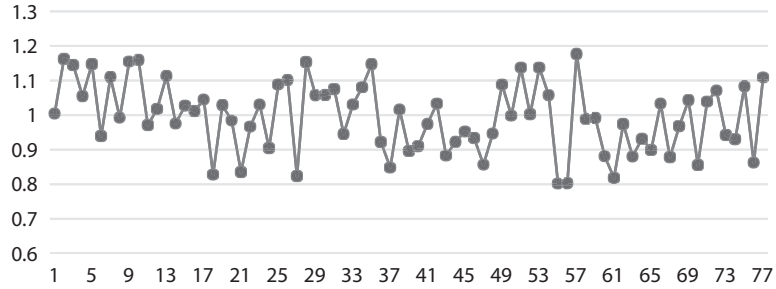

FIGURE 4. SCORES RELATED TO CRM FOR MEHRABAD AIRPORT

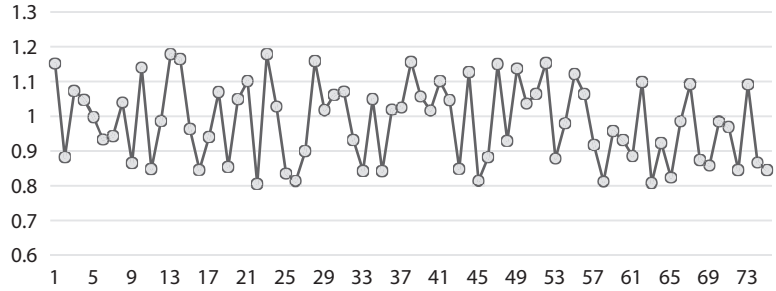

FIGURE 5. SCORES RELATED TO CRM FOR EMAM KHOMEINI AIRPORT

TABLE 4 DESCRIPTIVE STATISTICS RELATED TO DMUS' EFFICIENCY SCORES OBTAINED FOR THE TWO AIRPOΔRTS

	MEHRABAD				EMAM KHOMEINI			
CONCEPT	MIN	MAX	AVERAGE	STD	MIN	MAX	AVERAGE	STD
CRM	0.802	1.177	0.995	0.100	0.806	1.178	0.984	0.114
OE	0.824	1.155	0.986	0.078	0.830	1.166	0.993	0.091

than Emam Khomeini. The obvious reason for this is that decision making based on a single value such as the mean cannot be reliable when dealing with samples or populations, and statistical tests should be used to achieve reliable results. Therefore, to compare the performance of the two airports, a two-sample t-test is employed. It is also worthwhile to compare the performance of a specific airport from the CRM viewpoint to that from the OE perspective to realize whether the airport's performance with regard to either of the viewpoints is better than the other one. A paired t-test is used for this purpose. The results are as follows:

$$\mu_{CRM_M} = \mu_{CRM_{EK}}; \mu_{OE_M} = \mu_{OE_{EK}}; \mu_{CRM_M} = \mu_{OE_M}; \mu_{CRM_{EK}} = \mu_{OE_{EK}}$$

where μ_{CRM_M} and μ_{OE_M} denote the mean scores related to CRM and OE for Mehrbad airport, respectively, and $\mu_{CRM_{EK}}$ and $\mu_{OE_{EK}}$ represent the

mean scores for Emam Khomeini airport from the CRM and OE viewpoints, respectively. According to the results obtained, it can be concluded that, at the significance level of $\alpha = 0.05$, there is no statistically significant difference between the scores—neither between the airports nor between the two viewpoints.

Sensitivity Analysis

In this step, what is of high significance is to explore how each factor of CRM and each criterion of OE affects the airports' performance. For this purpose, as mentioned in the Methodology section, the factors of the two concepts are left out of the calculations one by one, and the scores of the DMUs are computed anew. The results obtained in the presence and absence of the factor are compared to each other through a paired t-test to find out whether there is a significant difference between their means. The results related to the Mehrabad and Emam Khomeini airports are presented in Tables 5 and 6, respectively.

TABLE 5 RESULTS OF SENSITIVITY ANALYSIS FOR THE MEHRABAD AIRPORT

TEST	TWO-TAILED PAIRED T-TEST P-VALUE	ONE-TAILED PAIRED T-TEST RESULT	EFFECT
No TMC	0.021	$\mu_F > \mu_i$	Positive
No CIM	0.319	$\mu_F = \mu_i$	Ineffective
No Tech	0.039	$\mu_F > \mu_i$	Positive
No WBM	0.284	$\mu_F = \mu_i$	Ineffective
No Cult	0.042	$\mu_F > \mu_i$	Positive
No Peop (CRM)	0.038	$\mu_F > \mu_i$	Positive
No Org	0.036	$\mu_F > \mu_i$	Positive
No Lead	0.044	$\mu_F > \mu_i$	Positive
No Stg	0.199	$\mu_F = \mu_i$	Ineffective
No Peop (OE)	0.040	$\mu_F > \mu_i$	Positive
No P&R	0.316	$\mu_F = \mu_i$	Ineffective
No PPS	0.184	$\mu_F = \mu_i$	Ineffective
No CR	0.042	$\mu_F > \mu_i$	Positive
No PR	0.028	$\mu_F > \mu_i$	Positive
No SR	0.291	$\mu_F = \mu_i$	Ineffective
No KR	0.174	$\mu_F = \mu_i$	Ineffective

Note: **TMC:** Top management commitment; **CIM:** Customer information management; **Tech:** Technology-based CRM; **WBM:** Win-back management; **Cult:** Culture; **Peop (CRM):** People; **Org:** Organization; **Lead:** Leadership; **Stg:** Strategy; **Peop (OE):** People; **P&R:** Partnerships and resources; **PPS:** Processes, products, and services; **CR:** Customer results; **PR:** People results; **SR:** Society results; **KR:** Key performance results.

TABLE 6	RESULTS OF SENSITIVITY ANALYSIS FOR THE EMAM KHOMEINI AIRPORT		
TEST	TWO-TAILED PAIRED T-TEST P-VALUE	ONE-TAILED PAIRED T-TEST RESULT	EFFECT
No TMC	0.019	$\mu_F > \mu_i$	Positive
No CIM	0.228	$\mu_F = \mu_i$	Ineffective
No Tech	0.041	$\mu_F > \mu_i$	Positive
No WBM	0.277	$\mu_F = \mu_i$	Ineffective
No Cult	0.033	$\mu_F > \mu_i$	Positive
No Peop (CRM)	0.041	$\mu_F > \mu_i$	Positive
No Org	0.034	$\mu_F > \mu_i$	Positive
No Lead	0.022	$\mu_F > \mu_i$	Positive
No Stg	0.317	$\mu_F = \mu_i$	Ineffective
No Peop (OE)	0.039	$\mu_F > \mu_i$	Positive
No P&R	0.402	$\mu_F = \mu_i$	Ineffective
No PPS	0.330	$\mu_F = \mu_i$	Ineffective
No CR	0.039	$\mu_F > \mu_i$	Positive
No PR	0.023	$\mu_F > \mu_i$	Positive
No SR	0.178	$\mu_F = \mu_i$	Ineffective
No KR	0.225	$\mu_F = \mu_i$	Ineffective

Note: For acronym definition, see note to Table 5.

Tables 5 and 6 show that regardless of different p-values, the results obtained with respect to the way each factor of CRM or OE affects organizational performance are entirely similar for both Mehrabad and Emam Khomeini airports. Strictly speaking, for both cases, the factors "top management commitment," "technology-based CRM," "culture," "people," and "organization" are positive CRM factors, and "leadership," "people," "customer results" and "people results" are positive OE factors, meaning that they have been appropriately implemented in both the airports and the employees are satisfied with them. All the other factors are ineffective, and no factor is realized as negative. This shows that no factor of CRM or OE has been executed unsuitably. Accordingly, no corrective action has to be taken with respect to any of the factors; however, positive factors could be used for benchmarking.

Conclusions

Over the years, the shift from a product-oriented view to a customer-oriented view realized by implementing CRM programs has enabled organizations to provide customers with satisfactory products and services and to gain desired benefits. In addition, the immense stresses of

competition and survival in the marketplace imposed by globalization have highlighted the significance of achieving OE through creativity and innovation. Taking advantage of both an appropriate CRM program and a suitable OE model is important for an organization's success and competitiveness. A review of the literature showed that these two concepts had not been studied together. This article aimed to fill this research gap by focusing on three goals: (1) investigation of the relationship between CRM and OE, (2) performance assessment from the viewpoints of CRM and OE, and (3) analysis of the way each factor of CRM and OE affects organizational performance. To demonstrate the applicability of the study, two major international airports of Iran, namely Mehrabad and Emam Khomeini as the representatives of Iran's aviation industry, were considered as our survey cases. Standard questionnaires containing questions about the factors of CRM and OE were designed and then distributed among the staff of the airports. The reliability and validity of the data were examined by Cronbach's alpha and factor analysis, respectively. Also, Harman's single-factor test showed that CMV did not affect the study findings.

To achieve the first goal of the article, experts were asked to make pairwise comparisons between the factors of CRM and criteria of OE. These opinions were thereafter input into fuzzy DEMATEL to obtain hypotheses on how each factor of CRM affected each criterion of OE and vice versa. The goodness-of-fit, convergent validity, and discriminant validity of the hypothesized model were tested. In the next step, path analysis was conducted to examine the hypotheses to find out which ones were supported and which ones were to be rejected. The results showed that out of 52 hypotheses proposed by fuzzy DEMATEL, 47 hypotheses were supported and the following five were rejected: (1) "strategy" positively affects "technology-based CRM," (2) "win-back management" positively affects "society results," (3) "win-back management" positively affects "key performance results," (4) "customer information management" positively affects "society results," and (5) "customer information management" positively affects "key performance results." The results obtained from this analysis can help managers understand that investment in a specific factor—for example, A—not only improves factor A but positively affects all other factors that are somehow connected to factor A.

In the next step of the research, the performance of either of the airports from both the CRM and OE points of view was evaluated separately by means of the DEA approach. The aim of this step was to realize how efficiently each of the airports functioned in terms of CRM activities as well as how successful they were in accomplishing excellence in personnel's opinions. Comparing the performance of the two airports to each other as well as the performance of each airport with regard to the two concepts revealed that, at the significance level of $\alpha = 0.05$, there was no statistically significant difference between the airports nor between the two viewpoints.

Next, it was of high significance to determine how each factor of CRM and each criterion of OE affected the performance of the airports. A paired t-test was used for this purpose. The results showed that for both Mehrabad and Emam Khomenin airports, the factors "top management commitment," "technology-based CRM," "culture," "people," and "organization" were positive CRM factors, and "leadership," "people," "customer results," and "people results" were positive OE criteria, meaning that they had been appropriately implemented in both the airports. In addition, all the other factors were detected to be ineffective, and no factor was identified as negative. These results can help managers take corrective actions with regard to negative factors while using positive factors for benchmarking. In our case, for example, the management decided to identify the strength points of "technology-based CRM" to be used for improving the organization's "customer information management."

Limitations and Directions for Future Research

As with all other studies, this one suffers from limitations that might be addressed by future studies. First, this article considered only a limited number of CRM factors, whereas many CRM factors have been defined in the literature. Second, the results presented here are related to only two airports in Iran, meaning that the findings cannot be generalized to other organizations.

The following directions are suggested for future research. First, other organizations, whether manufacturing or service, could be considered as the cases of the presented framework. An interesting empirical study could be comparing the performances of distinct industries or the performance of a specific industry from various countries based on CRM and OE concepts. Second, to present more generalizable results with regard to CRM, other CRM factors could be included, or even new meaningful factors could be defined based on the type of the industry or business. Third, other concepts that could affect an organization's success such as innovation, knowledge management, quality issues, and risk management could be incorporated in addition to CRM and OE. Finally, it is suggested to analyze how the factors considered in this study are linked with desired organizational outcomes such as customer satisfaction, customer loyalty, customer retention, and trust, as well as financial-performance indicators including profits and costs.

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Appendix I

The following text contains examples of the questions asked of the respondents.

1. Customer Relationship Management (CRM)

Top Management Commitment

1. Our top manager is dedicated to allocating resources for improving CRM programs at the same level as the other goals of the organization.
2. Our top manager cares about how well the employees perform their tasks by considering appropriate rewards and punishments.

Customer Information Management

1. Our organization has practices and tools to trace the status of our relationship with valued customers.
2. Our organization has practices and tools to capture and integrate customer data from contact points such as email, call-center, website, and fax.

Win-Back Management

1. Our organization has practices and tools to win back valued lost customers.
2. Our organization has practices and tools to evaluate the cost of winning back the lost customers.

Technology-Based CRM

1. Our organization establishes appropriate web-based customer interaction.
2. Our organization uses a call center, email, a unique website, or computer telephone integration to handle customer demands, suggestions, and complaints.

Culture

1. We think from the customer's standpoint and focus on finding innovative ways of working to serve our customers individually.
2. One of our main goals is to establish appropriate interactions with all customers and gain their satisfaction by creating value-adding opportunities for them.

People

1. Our employees have a thorough market sensing. They understand our customers and have the capability to create, maintain, and

improve customer relationships by gaining customers' respect and trust.
2. Our employees have outstanding business knowledge and skills to persuade customers to select our organization.

Organization

1. In our organization, the internal communication works flawlessly and smoothly between customer-facing employees, as well as between them and the rest of the employees.
2. Our organization brings perfect knowledge of different functions and task groups together to deliver services that meet our customers' needs.

2. Organizational Excellence (OE)

Leadership

1. Our top manager is a role model of an excellence culture who visualizes the future and makes it happen.
2. Our top manager clearly sets strategy, goals, and objectives for future directions of the organization.

Policy and Strategy

1. Well-defined policy and strategy are developed, reviewed, and updated regularly.
2. Policy and strategy are based on information from performance, measurement, research, learning, and creativity-related activities.

People

1. Employees' knowledge and skills are identified, maintained, and improved.
2. Employees receive training that helps them accomplish the goals associated with their responsibilities.

Partnerships and Resources

1. External partnerships are managed appropriately.
2. Finances are managed appropriately.
3. Information and knowledge are managed appropriately.

Processes

1. Services are designed, developed, and managed based on customer needs and expectations.
2. Processes are systematically improved using innovation to fully satisfy and create increasing value for customers.

Customer Results

1. Surveys show that our customers motivate other people to become our customers.
2. We have a decreasing rate of complaint.

People Results

1. A constant improvement in employees' performance from every aspect is recognizable.
2. I, as one of the employees, am satisfied with the overall performance of our organization.

Society Results

1. Our organization is renowned for its excellent performance.
2. Our organization cares about environmental issues.

Key Performance Results

1. Our organization has a good financial situation.
2. Our organization has a good market share.

Appendix II

TABLE I RESULTS OF FACTOR ANALYSIS, RELIABILITY, AND CONVERGENT VALIDITY

	MEHRABAD			EMAM KHOMEINI		
	LOADING	CRONBACH'S ALPHA	AVE	LOADING	CRONBACH'S ALPHA	AVE
TMC		0.743	0.615		0.784	0.642
Q1	0.769			0.770		
Q2	0.799			0.831		
CIM		0.771	0.625		0.801	0.532
Q1	0.831			0.752		
Q2	0.748			0.706		
Tech		0.803	0.585		0.799	0.541
Q1	0.830			0.744		
Q2	0.694			0.727		
WBM		0.712	0.607		0.752	0.670
Q1	0.713			0.796		
Q2	0.840			0.840		
Cult		0.797	0.521		0.830	0.613
Q1	0.695			0.814		
Q2	0.748			0.751		
Peop (CRM)		0.709	0.547		0.775	0.638
Q1	0.690			0.753		
Q2	0.786			0.842		
Org		0.836	0.618		0.707	0.668
Q1	0.800			0.807		
Q2	0.772			0.828		
Lead		0.773	0.668		0.715	0.580
Q1	0.818			0.846		
Q2	0.850			0.662		
Q3	0.792			0.817		
Q4	0.808			0.707		
Stg		0.730	0.512		0.828	0.608
Q1	0.659			0.783		
Q2	0.719			0.730		
Q3	0.765			0.824		
Peop (OE)		0.714	0.553		0.793	0.512
Q1	0.814			0.700		
Q2	0.666			0.731		
P&R		0.811	0.559		0.729	0.561

TABLE I CONTINUED

	MEHRABAD			EMAM KHOMEINI		
	LOADING	**CRONBACH'S ALPHA**	**AVE**	**LOADING**	**CRONBACH'S ALPHA**	**AVE**
Q1	0.803			0.679		
Q2	0.719			0.775		
Q3	0.717			0.788		
PPS		0.809	0.600		0.800	0.629
Q1	0.740			0.831		
Q2	0.848			0.869		
Q3	0.730			0.665		
CR		0.722	0.612		0.712	0.595
Q1	0.737			0.720		
Q2	0.825			0.819		
PR		0.782	0.620		0.761	0.548
Q1	0.841			0.666		
Q2	0.710			0.799		
Q3	0.805			0.750		
SR		0.719	0.514		0.706	0.669
Q1	0.691			0.868		
Q2	0.742			0.765		
KR		0.832	0.573		0.785	0.612
Q1	0.741			0.809		
Q2	0.794			0.790		
Q3	0.734			0.746		

TMC: Top management commitment; **CIM:** Customer information management; **Tech:** Technology-based CRM; **Cult:** Culture; **WBM:** Win-back management; **Peop:** People; **Org:** Organization; **Lead:** Leadership; **Stg:** Strategy; **P&R:** Partnerships and resources; **PPS:** Processes, products, and services; **CR:** Customer results; **PR:** People results; **SR:** Society results; **KR:** Key performance results.