A study of how to implement a successful CRM by identifying challenges using DEMATEL method: An empirical study on small to medium business units

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A R T I C L E I N F O	A B S T R A C T
	This paper identifies and analyzes barriers of customer relationship management (CRM) implementation in SMEs. Hence, based on a comprehensive review of the literature and gathering the viewpoint of experts, the influencing barriers are identified. In order to analyze the identified barriers, DEMATEL methodology is applied and a causal model of the relationships between barriers is developed. Furthermore, based on the DEMATEL results the barriers are also categorized into two groups of driver and dependent. The results of study show that inadequate budget, organization culture, obligation of major management to CRM and inadequate access to modern technical knowledge are among effective impediments and play important role in successful establishment of customer relationship management system.

1. Introduction

During the past few years, many organizations attempt to promote their relationships with customers through exploitation of information and communication technology. Hence, utilization of management creativities with customer is one the most important discussion in the field of marketing management and information technology. Rafeie rad et al. (2011), for instance, used factor analysis as an agile supply chain classification for a real-world case study of part supplier. Recently, various organizations look differently at customer relationship management. Afshari et al. (2011) studied the key factors affecting green supply chain. Cheshmberah et al. (2011) presented a mathematical model for a special form of supply chain and implemented their method for a case study of food industry. Some organizations implement customer relationship management (CRM) system as one of technical instrument and the others consider it as an inalienable item for business (Ozgener & Ïraz, 2006). Although CRM system helps managers and organizations succeed in competitive fields but there are studies, which show that most of organizations failed in implementing and using CRM, properly.

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Mendoza et al. (2007) presented an outstanding work for assessing critical success factors on implementation of supply chain. Therefore, the goal of this study is to recognize effective impediments in successful implantation of CRM system for small and medium companies and analyze interrelations among these impediments.

There are different definitions for CRM system as a strategy of business (Jackson, 2005); some people define it as an approach of measurement for customer's needs and profitability improvement (Fitzgibbon & White, 2005). Dee and Van den Battel (2002) defined CRM system as an approach of cross functional to get continuous and uninterrupted relationship with customers in order to keep customer and effectiveness of activities and marketing creativities. Strategy of CRM system involves information and internet technology, marketing, production and operations, sale, servicing to customer, human being resources, research and advancement in order to raise profitability of communication with customers. CRM system provides easiness and simplicity for ordering goods and services as well as easiness in utilization of communication with customers. CRM system is referred to all sorts of commercial activities for initiation, establishment, keeping and successful advancement of long-term communication with customers (Mendoza et al., 2007). CRM system is a collection of methodologies and instruments to help companies manage their relationships with customers organizationally (Ozgener & Ïraz, 2006). Many researchers have considered CRM in various fields and Table 1 shows a summary of some of these issues.

Table 1
A summary of CRM studies

Author	Year	Aim of research
Mendoza et al.	2007	To Identify the critical reasons for success in strategy of CRM system
King & Burgess	2008	To Identify the reasons for success and defeats in strategy of CRM system
Seeman & O'Hara	2006	To establish studies of communication management with customer
Cheng et al.	2005	To present a framework for CRM system in elderly rest home
Sigala	2005	To present a model for communication management with customer
Ryals & Payne	2001	To assess the acceptance and the usage of communication management with customer

2. The proposed study

CRM has been widely used as regular operations in various industries but recently, there have been some studies to emphasize that many CRM implementations faced with some challenges (G.I.G, 2001). Verhoef et al. (Verhoef & Langerak, 2002) reported that rate of successful establishment for CRM systems is from 30% to 70%. Hence, there has been a growing interest on identification, derivation and analysis of suitable methods for successful implementation of CRM systems. Subsequent to assessment of studies and perception of experts' opinions, 9 impediments of successful implantation for CRM systems were recognized in this research, which are shown in Table 2.

Table 2
Identifying the most important impediments of CRM system

No.	Impediments	symbol
1	Lack of strategy proportion of organization with CRM	F_1
2	Insufficiency of special budgets for CRM	F_2
3	Organizations are not prepared culturally	F_3
4	Lack of obligation of major management to CRM	F_4
5	Weak relationships in organization	F_5
6	Lack of regards to educational needs of people	F_6
7	Lack of experts in organization	F_7
8	Lack of suitable access to updated technical knowledge	F_8
9	Unsuitable distribution channels	F_9

The proposed study of this paper consists of three steps. In the first step, an interview is employed among different experts from various small and medium size industries to learn more about different perspectives of CRM concerns. We also study the existing literature to get more ideas on CRM implementations and its impediments. In the second step, using the results of the first step, a questionnaire is prepared to determine the relationships among CRM implementations and their impediments. In our survey, we distributed the questionnaire among 13 experts and managers in different small and medium companies. In the third step, analysis of questionnaire is done by DEMATEL methodology based on the aforesaid questionnaire to determinate the relationships.

2.1. DEMATEL method

DEMATEL is a sophisticated method, which could analyze complex relationships among elements of a subject. A collection of effective variables on a system is structured in a diagram of cause and effect. By exploiting DEMATEL results, managers and researchers are able to get complete perception of relationships among variables.

2.2 Computation steps of DEMATEL

In the first step, the relationships among all variables are doubly evaluated on the basis of experts' opinions and a spectrum of quadripartite is derived. In this spectrum, 0 shows lack of effect, 1 shows little effect, 2 shows medium effect and 3 shows high effect. In this research, opinions of 13 experts (universal and productive managers) are used to identify relationships among effective factors and 13 matrices have been achieved where direct relationships among factors were doubly evaluated. In order to consolidate opinions, achieved correspondent numbers are averaged and a unit matrix namely average matrix is achieved. Table 3 shows the details of our computations.

2.2.1 Computation of primary normalized matrix of direct relations

Primary normalized matrix of direct relations is achieved on the basis of average matrix and exploiting relations of number 1 and 2 and the summary of the results are shown in Table 4.

$$M = k.A, \tag{1}$$

$$k = \frac{1}{\max\limits_{1 \leq i \leq n} \sum\limits_{j=1}^{n} a_{ij}}, \quad i, j = 1, ..., n \tag{2}$$

where a_{ij} represents the degrees of effect in the factor of i on factor j.

Table 3
Average matrix of (A)

Factor	F_1	F_2	F_3	F_4	F_5	F_6	F_7	F_8	F_9
F_1	0.000	0.000	0.000	0.000	2.431	0.000	1.782	0.000	0.000
F_2	1.721	0.000	0.000	0.000	1.723	2.423	2.516	2.562	1.262
F_3	2.562	1.981	0.000	2.423	2.671	2.812	1.827	1.635	1.736
F_4	2.431	1.982	2.431	0.000	1.561	2.615	1.726	0.000	2.736
F_5	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.524
F_6	1.424	0.000	0.000	0.000	1.524	0.000	2.671	0.000	1.241
F_7	1.524	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.000
F_8	0.000	1.543	0.000	1.432	2.271	2.891	1.723	0.000	2.832
F_9	0.000	0.000	0.000	0.000	1.543	0.000	0.000	0.000	0.000

Table 4
Primary normalized matrix of direct relations

Factor	F_1	F_2	F_3	F_4	F_5	F_6	F_7	F_8	F_9
F_1	0.000	0.000	0.000	0.000	0.138	0.000	0.101	0.000	0.000
F_2	0.098	0.000	0.000	0.000	0.098	0.137	0.143	0.145	0.072
F_3	0.145	0.112	0.000	0.137	0.151	0.159	0.104	0.093	0.098
F_4	0.138	0.112	0.138	0.000	0.088	0.148	0.098	0.000	0.155
F_5	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.143
F_6	0.081	0.000	0.000	0.000	0.086	0.000	0.151	0.000	0.070
F_7	0.086	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.057
F_8	0.000	0.087	0.000	0.081	0.129	0.164	0.098	0.000	0.160
F_9	0.000	0.000	0.000	0.000	0.087	0.000	0.000	0.000	0.000

2.2.2 Computation of comprehensive matrix of relations (T)

While primary normalized matrix of direct relations was accounted, comprehensive matrix is achieved by exploiting Eq. (3). Direct and indirect relationships among factors are shown Table 5.

$$T = M(I - M)^{-1} \tag{3}$$

Table 5
Comprehensive matrix of relationships

Factor	F_1	F_2	F_3	F_4	F_5	F_6	F_7	F_8	F_9	Influential Power
F_1	0.009	0.000	0.000	0.000	0.142	0.000	0.102	0	0.026	0.278
F_2	0.132	0.014	0.002	0.012	0.165	0.165	0.199	0.1472	0.1451	0.981
F_3	0.218	0.141	0.021	0.149	0.264	0.223	0.208	0.1154	0.2169	1.556
F_4	0.207	0.133	0.141	0.022	0.195	0.197	0.188	0.0324	0.2393	1.354
F_5	0.000	0.000	0.000	0.000	0.013	0.000	0.000	0	0.1448	0.157
F_6	0.095	0.000	0.000	0.000	0.107	0.000	0.161	0	0.0945	0.457
F_7	0.087	0.000	0.000	0.000	0.017	0.000	0.009	0	0.06	0.173
F_8	0.052	0.099	0.012	0.084	0.194	0.194	0.158	0.0154	0.2341	1.042
F_9	0.000	0.000	0.000	0.000	0.088	0.000	0.000	0	0.0126	0.101
Correlations	0.799	0.388	0.175	0.267	1.184	0.779	1.024	0.310	1.173	

2.2.3 Making diagram of cause and effect

Influential power and coherence scale on every one of factors are accounted to draw diagram of cause and effect. Degree of influence for any factor is achieved by collection of level related to that factor. For example, existed numbers in F_1 level shows degree of direct and indirect effects that F_1 factor has on other factors. Influential power and coherence scale for each factor are shown in Table 5. Subsequent to computation of influential power and degree of dependency, collection of influential power and coherence scale are accounted for each factors.

In Table 6, (Di+Ri) displays all effects that factor of (i) has on other factors. Hence, (Di+Ri) shows the degree of importance on entire system. Therefore, (Di-Ri) is accounted with all factors and shows pure effect of factor (i) has on overall system. When (Di-Ri) is positive, factor of (i) belongs to cause factors and while (Di-Ri) is negative, factor of (i) belongs to the effected factors.

Table 6
Degree of (Di+Ri) and (Di-Ri)

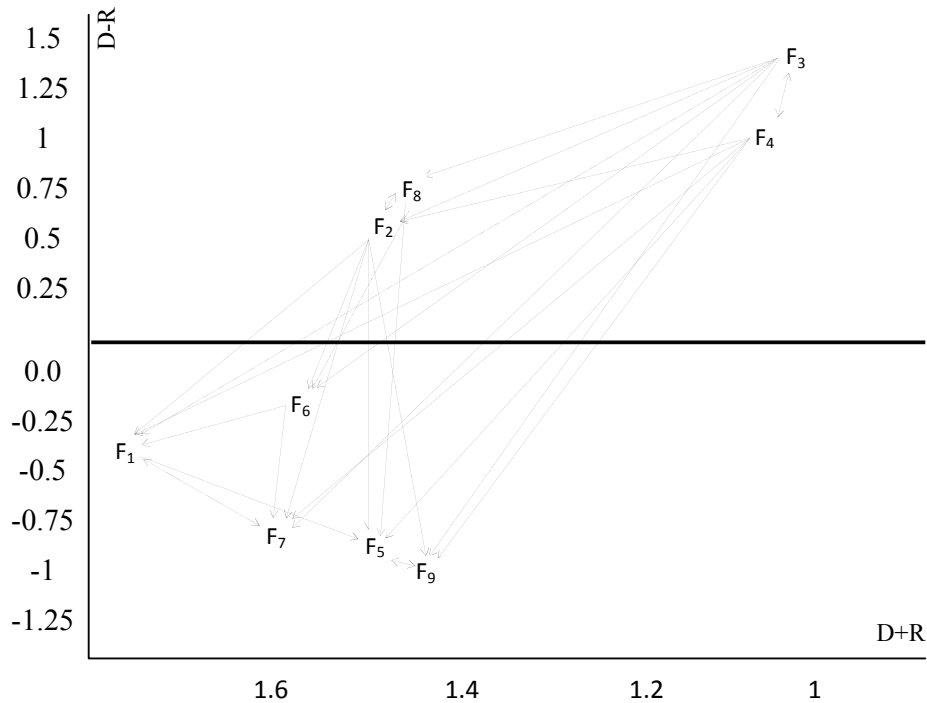| Factor	D	R	D+R	D-R
F_1	0.2782	0.7994	1.0776	-0.5212
F_2	0.9814	0.3875	1.3689	0.5939
F_3	1.556	0.1749	1.7309	1.3811
F_4	1.3539	0.2671	1.621	1.0868
F_5	0.1574	1.1843	1.3417	-1.0269
F_6	0.4572	0.7793	1.2365	-0.3221
F_7	0.1728	1.0237	1.1965	-0.8509
F_8	1.0423	0.3104	1.3527	0.7319
F_9	0.1007	1.1733	1.274	-1.0726

Fig. 1. Bilateral relationships among all affecting criteria

Comprehensive matrix of relations presents useful information about status of bilateral relationships among factors. As we can observe, there are some poor relationships, which are considered as unimportant and they could be removed from our operations. In this research, initiative scales were achieved using the average of elements.

3. Discussion

In the first step, 9 establishing impediments of customer relationship management system in the small and medium companies were recognized through evaluation of research literature and perception of universal experts and productive managers in this study. Consequently, DEMATEL technique was used to analyze identified factors. Traditional methods of multi criterion decision making is usually stabilized on the assumption of independency of factors from each other. DEMATEL technique helps identify the cause and effect relations. The results of study show that inadequate budget, organization

culture, obligation of major management to CRM and inadequate access to modern technical knowledge are among effective impediments and play important role in successful establishment of customer relationship management system.

4. Conclusions

In this paper, we have performed a comprehensive study to identify and to analyze the barriers of the implementation of customer relationship management for SMEs. The proposed study of this paper reviewed the literature and gathered various experts' viewpoints and the identified influencing barriers. In order to analyze the identified barriers, DEMATEL methodology has been used and a causal model of the relationships among barriers has been developed. Furthermore, based on the DEMATEL results the barriers are also categorized into two groups of driver and dependent. The results of study showed that inadequate budget, organization culture, obligation of major management to CRM and inadequate access to modern technical knowledge are among effective impediments and play important role in successful establishment of customer relationship management system.

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