A SEM Approach to Determine the Critical Success Factors Involved in CRM Implementation

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Abstract: The aim of this research is to study which the critical success factors are determining the success in a Customer Relationship Management implementation in Small and Medium sized Enterprises. Required data are collected with a quantitative approach and a questionnaire. The questionnaire was distributed among managers in Spanish SMEs and gathered data were examined using the structural equation modelling method. The results of this study reveal that sociodemographic, organizational and customer orientation variables have positive and significant impacts on the satisfaction of the implementation of CRM. A set of theoretical contributions and practical implications was also discussed. Current study helps managers to understand the role and importance of successful implementation of CRM in SMEs.

Keywords: CRM, CSF, SME, Implementation, SEM.

1. Introduction

Nowadays, Internet is changing the way enterprises established relationships with their customers who are gradually expecting better services, more efficient and more convenient. In this environment companies can improve performance by tailoring marketing information based on the characteristics of the individual customer (Meena, & Sahu, 2021; Lewis, Whitler & Hoegg, 2013). In this sense, Customer relationship management (CRM) is becoming more and more important as a key of competitive advantage for businesses (Guerola-Navarro, *et al.*, 2021; Zaby & Wilde, 2018) and as a package of applications it needs to be inserted into the organisational processes to attain programmed functionality (Desai & Subrat, 2008). It is an information technology management tool, which manages the relationship with customers to better understand them with the aim of retaining customers (Chen & Su, 2006). CRM consists of guidelines, procedures, processes and strategies which provide organizations the ability to merge customer connections and also keep track of all customer-related information (*Khan, Ehsan, Mirza & Sarwar, 2012*). Another viewpoint about the definition of CRM poses that it is a strategy that needs to create a new business atmosphere, which propose a real management of relationships with customers (Soltani &Navimipour, 2016). CRM is defined as a strategic process of improving owners' value through the development of appropriate relationships with strategic customers and includes a marketing strategy and the value chain of the firm to attain greater productivities in giving value to customers (Gil-Gomez, *et al.*, 2020; Soltani & Navimipour, 2016; Giannakis-Bompolis & Boutsouki, 2014). In this context, to ensure long-term relationships with customers that have a high level of satisfaction with the product or service have become crucial for survival amongst industries. Though, the reality is very different and many CRM business processes are deficient and inflexible. The adoption, use and performance of CRM strategy have emerged as an active research area in the academic and professional environment mostly for Small and Medium sized enterprises (SMEs) with scarce resources (Ahani, Ab. Rahim & Nilashi, 2017).

Several Small and Medium sized Enterprises have implemented CRM in the same way as large organizations to compete effectively worldwide (Alshawi, Missi & Irani, 2011; Ramdani, Kawalek, & Lorenzo, 2009). There is no doubt that they are considered as a potential source of economic growth in national, regional and local perspectives (Taylor & Murphy, 2004). Small and medium enterprises are crucial in the entrepreneurship environment because they usually occupy niche markets, promote innovation, economic variety and social stability, and are an active factor of competitiveness (Grimmer, Grimmer and Mortimer, 2018; Franco and Haase, 2010; Omri and Frikha, 2014; Hallak

et al., 2018). Still, the research in CRM adoption in the SME context is still scarce. The review of CRM studies in the SME context confirms that scholars usually use the Technology Organization Environment theory to study a different kind of CRM adoption. The scope of this research in to increase the understanding around the implementation of CRM in SMEs through a quantitative approach using a questionnaire passed to managers of SMEs as the data collection method to test their level of satisfaction about the application of CRM in their business and to identify which factors determine the satisfaction in the level of implementation of CRM, in line with (Fu et al., 2014), who suggest that SMEs need to determine which are the factors that have to be considered when adopting CRM and furthermore to have success on it. So firstly, we have done a literature review of the topic, and then we have done an empirical analysis based on SME manager's perspective through a structural equation model (SEM) approach using the confirmatory factorial analysis (CFA). This investigation is supported by the information systems success model (Delone and McLean IS success model) which seeks to provide a comprehensive understanding of IS success by identifying, describing, and explaining the relationships among the most critical dimensions of success used commonly to evaluate IS (DeLone and McLean, 1992). And it is also based on the resource-based view theory (Barney, 1991) where a CRM is considered a strategic resource with the potential to achieve sustainable advantage to a firm.

This article is arranged as follows: section 2 presents a review of the literature regarding CRM and factors that affect CRM adoption and the Hypotheses. Section 3 described the methodology used in the study. Section 4 discusses the findings of the study and implications. Finally, section 5 presents the conclusions and limitations of the study.

2. Theoretical Background

2.1 CRM Overview

The effective implementation of customer relationship management can help to win customers to access to further improve the competitiveness of enterprises and economic benefits (Wang & Zhang, 2008). CRM provides SMEs with opportunities that are still largely unexploited (Horowitz, 2005).This technology facilitates the process to acquire, improve, and maintain customer relationships more proficiently (Hung et al., 2009). CRM offers the promise of increased customer loyalty (Dowling, 2002; Colgate & Danaher, 2000), better customer satisfaction (Mithas, Krishnan & Fornell, 2005; Colgate & Danaher, 2000), greater customer retention (Rigby & Ledingham, 2004; Day & Van den Bulte, 2002) and improved revenue (Rigby & Ledingham, 2004; Starkey & Woodcock, 2002) for organizations. However, many companies that have implemented CRM systems report unsatisfactory levels of development (Becker, Greve & Albers, 2009). CRM and the results of CRM implementation projects have drawn considerable practitioner dissatisfaction (Ang & Buttle, 2006; Howarth, 2003; Kale, 2004; Trembly, 2002; Vizard, 2002). This disappointment is mainly due to the belief that CRM systems fail to live up to expectations, CRM resulted in no measurable changes in relationship strength, sales levels, or increases in customer loyalty (Stanton & Rubenstein, 2003). CRM is generally regarded to have real effects in the firms which transact with final consumers but a small number of SMEs adopting CRM do not enjoy much benefit on productivity (Shin, 2006). However, it is important to understand that as Peltier, Schibrowsky and Zhao (2009) pose, the CRM adopters have specific characteristics such as higher product class knowledge, a greater risk orientation, or had a more open business change orientation that may facilitate a successful implementation of this system.

The open European market and the increasing competition demand fast reaction, generating a serious challenge for SMEs handling with a lack of financial and other resources. Therefore, SMEs pay an increasing attention to serve their customers at a high level so they often look for an ICT solution (Reicher & Szeghegyi, 2015). Due to these circumstances it is really important for the enterprises to select and implement the most appropriate CRM solution rapidly, efficiently and at the lowest risk of possible failure. Though, this requires to adequate this methodology, which offers success for them, with the thorough knowledge of competencies of the organization and the wide range of solutions available on the market. However, information technologies in SMEs has a low level of implementation and some specific modules such as ERP, BI, CRM, e-Commerce, e-Business or Cloud Technology are rarely used (Edelhauser, Lupu & Lorint, 2014).

2.2 Factors Affecting CRM Appropriate Level of Implementation

Once we have done an extensive literature review on the topic, we have developed a success model for CRM implementation, taking into account ten variables mentioned in the literature divided into three factors: sociodemographic, organizational and customer orientation factors. Similar to other previous studies, such as Chen & Ching (2004); Eid, (2007) or Roh et al. (2005), these factors can have direct or indirect effects on CRM success so we have considered these possible effects in the statistical estimation of the success model.

2.3 Sociodemographic Factors and CRM Appropriate Level of Implementation

Previous researches about CRM have hypothesized that CRM benefits differs by type of industry as the processes and technologies linked with CRM are designed to specific industry structures (Rust, Lemon & Zeithaml, 2001). Steel, Dubelaar and Ewing (2013) pose that the sector can affects the implementation in small business of any information technology such as CRM. There are early researchers that have hypothesized also that business size is another factor that affect the level of satisfaction with the implementation of CRM (Hung et al., 2009; Lin, 2006; Chen, 2003; Kimberly & Evanisko, 1981). Nguyen & Waring, (2013) states that the decision to implement a CRM system is influenced by some factors such as management's perception of CRM, employee involvement, firm's size or its perceived market position. On the other hand, another line of research of the topic suggests that size is not decisive in the information technologies adoption in SMEs (Levy et al., 2001). Therefore, sociodemographic factors affect an appropriate level of implementation of CRM so the next hypothesis follows:

H1. Sociodemographic factors are positively linked to CRM appropriate level of implementation.

2.4 Organizational Factors and CRM Appropriate Level of Implementation

Generally, organizational factors refer to factors directly or indirectly related to four main parts of a business: structural, operational, human and managerial (Alshawi et al., 2011). In this sense, the characteristics investigated were if the company evaluated its situation to determine its strengths and opportunities to start the project CRM, if the project is fully focused on solve clients' problems or meet client needs, if the company considers very important business variables and finally, if suppliers are linked to the company CRM project in line with Daniel & Wilson (2002) or Lai & Hsieh (2007) which expose that external pressure has significant influence on CRM adoption. Most factors influencing SME adoption of other ICT innovations are similar to factors affecting the adoption of CRM. Also, organizational, technical and data quality-related factors influencing CRM adoption in SME context (Alshawi et al., 2011). Finally, Dwivedi et al., (2009) pose that SMEs were found to be more influenced by technological and organizational factors than environmental factors. Moreover, the results of their investigation indicate that relative advantage, experiment before adoption, top management support, organizational readiness and a larger size are predictors of becoming adopters of CRM. Consequently, organizational factors affect an appropriate level of implementation of CRM so the next hypothesis follows:

H2. Organizational factors are positively linked to CRM appropriate level of implementation.

2.5 Customer Orientation Factors and CRM Appropriate Level of Implementation

Customer orientation within a CRM system allows the system to support the firm´s marketing campaign efficiency and also, discovers and satisfies customer needs (Chuang & Lin, 2013). The importance of a customer relationship orientation and data issues around social media use promote the importance of customer engagement in online communities and recognize the driving role of information processes (Harrigan & Miles, 2014). In this sense the characteristics analyzed were if the project was fully focused on solve customer problems or meet their needs, if the company maintain strong long term relationships with their customers, if the model of relationship with the customer allows them to participate in the design of their products or if the company defines its objectives taking into account the aims of its customers.

Consequently, a customer orientation is an indispensable prerequisite for the successful implementation of CRM (Bentum & Stone, 2005). On this basis, the next hypothesis follows:

H3. Customer orientation factors are positively linked to CRM appropriate level of implementation.

3. Research Methodology

3.1 Methodology

A questionnaire was designed to measure the managers' perception of the level of implementation of CRM in their companies. The sample population were small and medium sized companies in accordance with the business population in Spain, 99.8% of the enterprises have a small dimension by number of employees (DIRCE, 2020). The final sample is represented by a 53% of medium sized enterprises and 47% of small business. Regarding the sample by activity sector, most of the businesses belong to the services sector and have CRM systems in a range of six to ten years. Finally, the sample consisted on 175 correctly completed questionnaires. On this sample of 175 SMEs the proposed model of CRM success was tested.

After the data collection, we used the structural equation methodology to test the proposed CRM implementation success model empirically. The target population for the empirical study consists of SME located in Spain. The reason for choosing this business was that CRM is extremely important based on the close relation with customers that small business have. In this research it is followed the key-informant methodology, taking the managers as informants as in earlier studies (Bang, 2005; Wu, 2002).

3.2 Measurement Scale

To build the measurement scale for the model variables it was consulted various studies and drew up a list of nine specific items of CRM and three sociodemographic items to measure these variables (see Table 1). The survey consisted on socio-demographic questions and then questions about the accountants' perception of the level of implementation of ERP in their companies. The survey was designed and validated with several experts in the issue. The questionnaire takes approximately 5 minutes to complete. The sociodemographic variables were, Sector divided into Primary, Manufacture and, Services; Number of years, represented by the years of activity of the business and finally, Business size represented by the number of employees is a dummy variable where 0 are small businesses and 1 are medium sized businesses. Each of the Organizational and Customer orientation items were answered using a five-point Likert scale because it is a common rating format for surveys (Allen & Seaman, 2007) were 1= Totally Disagree, 2= Disagree, 3= Neutral, 4= Agree and 5= Totally Agree) except the variable if the company use a CRM system that it is a dummy. There is also an open-ended section for comments. The sample is considered as large since according to Anderson, *et al* (2004).

Table1. Measurement scale items for model variables

Code	Variable	Description	Values
D_BS	Business size	Business size (nº employees)	0= from 0 to 10 employees, 1= from 11 to 49 employees, 2= from 50 to 249 employees,3= more than 250 employees
D_S	Sector	Primary, Manufacture, Services	0= Manufacture, 1= Services, 2= Agriculture
D_Y	Number of years	Number of years of activity	0= from 0 to 5 years, 1= from 6 to 10 years, 2= more than 10 years
CRM_B	CRM management	The company use a CRM system	Dummy
CRM_D	Level of implementation of CRM	The level of implementation of CRM is appropriate	1= Totally disagree, 2= Disagree, 3= Neutral, 4=Agreement, 5= Totally agree.

CRM_SO	Prior asessment	The company assessed its situation to determine its strengths and opportunities to start the project CRM	1= Totally disagree, 2= Disagree, 3= Neutral, 4=Agreement, 5= Totally agree.
CRM_CN	Focus on client	The project is fully focused on solve clients problems or meet client needs	1= Totally disagree, 2= Disagree, 3= Neutral, 4=Agreement, 5= Totally agree.
CRM_BV	Business variables	The company considers very important business variables	1= Totally disagree, 2= Disagree, 3= Neutral, 4=Agreement, 5= Totally agree.
CRM_S	Suppliers linking with CRM	Suppliers are linked to CRM project of the company	1= Totally disagree, 2= Disagree, 3= Neutral, 4=Agreement, 5= Totally agree.
CRM_LT	Strong long term relationships with customers	Maintain strong long term relationships with customers is very important to the company	1= Totally disagree, 2= Disagree, 3= Neutral, 4=Agreement, 5= Totally agree.
CRM_P	Participation of customers in the design of their products	The model of relationship with the customer allows them to participate in the design of their products	1= Totally disagree, 2= Disagree, 3= Neutral, 4=Agreement, 5= Totally agree.
CRM_OC	Definition of objectives priorizing the customer's aims	The company defines its objectives taking into account the aims of the Customers	1= Totally disagree, 2= Disagree, 3= Neutral, 4=Agreement, 5= Totally agree.

Source: own elaboration

3.3 Analysis of Validity, Reliability, and Dimensionality of Measurement Scale

The validity of a measurement scale refers to the extent to which the measurement process is error-free. To ensure content validity, a pretest of the questionnaire was made by five experts (four researchers in accounting and an accountant). Finally, with regard to external validity, the sampling technique used (random sampling) allows that the results are generalizable to the population. We used a reliability coefficient—the Cronbach alpha—to analyze the reliability of the scale. This coefficient evaluates the consistency of the full scale, and is the most frequently used measure (Hair *et al.,* 2004). The Cronbach's alpha is tested to measure the internal consistency of the survey, meaning how closely related a set of items are as a group, therefore considered to be a measure of scale reliability (Cronbach, 1951) with a measure of 0,836 which is a strong reliability according to George and Mallery (1995).

3.4 Structural Model Testing

In order to test the proposed hypotheses, we followed a structural equation methodology (SEM), which allowed us to evaluate the suitability of the theoretical model under analysis with respect to the empirical data, and examine the significance of specific hypotheses using Maximum likelihood estimation. This research uses the Confirmatory Factor Analysis (CFA) as a mechanism to show the analysis of the theoretical relationships between CRM and the sociodemographic factors, organizational factors and customer orientation factors. SEM aims to analyze

the interconnected relationships among a set of constructs simultaneously (Cheng & Fu, 2013).We use the statistics package AMOS 27 to estimate the SEM model as well as SPSS 27 for the previous analysis.

3.5 Analysis of Results

First, values of the unknown parameters and their respective measurement error are determined in the estimation phase. This process was done using Maximum Likelihood Estimation, because it is considered efficient and unbiased when the assumptions of multivariate normality are not met. Then we obtained the model goodness-of-fit but we have to do some modifications to the specification model to improve its fit.

The resulted model achieves satisfactory fit to data (see Table 2). The minimum discrepancy ratio CMIN/DF (1.972) proofs the statistical significance of the model; the root mean square error of approximation (RMSEA) shows a moderate value of 0.075. Regarding the incremental fit indexes, they are all above the cut-off value, the CFI takes a value of 0.984, RFI (0,953), IFI (0,984), TLI (0,976), and the Normalized Fit Index (NFI) (0,968). Finally, the parsimony fit indexes are in the medium scale, showing a PRATIO (0,682) a PNFI (0,66) and the PCFI (0,671). So in general terms, as Schreiber *et al.* (2006) state, the ratio model estimates are above the recommended threshold for a good fit.

Table 2. Goodness-of-fit measures

Measure	Shorthand	Value	Rating		
			Low	Medium	High
Absolute Fit	CMIN	88,748	X		
	CMIN/DF	1,972			X
	NCP	43,748			
	AIC	178,748		X	
	ECVI	1,033			X
	BCC	186,06		X	
	RMSEA	0,075		X	
Comparative or Incremental Fit	NFI	0,968			X
	RFI	0,953			X
	IFI	0,984			X
	TLI	0,976			X
	CFI	0,984			X
Parsimonious Fit	PRATIO	0,682		X	
	PNFI	0,66		X	
	PCFI	0,671		X	

Source: Own elaboration

To verify the validity of the hypotheses and thus determine their predictive capacity the resulting relationships were analyzed and the results of the model shows that there are positive influences in the level of satisfaction with the level of implementation of CRM of the majority of proposed factors in line with Wang and Zhang (2008) and opposite to Ang and Buttle (2006) or Kale (2004) (see Figure 1 and Table 3). In line with (Mendoza et al., 2007; Nguyen, Sherif, & Newby, 2007; Ryals & Knox, 2001) the organizational variables are determinant in the CRM success. The estimated model shows that the organizational variables are antecedents of CRM success so hypothesis 2 was accepted. This study confirmed also that organization elements have a significant relationship to social CRM adoption consistent with previous studies (Nguyen & Waring, 2013; Shah Alam *et al,* 2011; Dwivedi *et al.,* 2009).

The results show that the parameters more significant are those related to customer orientation factors with the same level of significance (p-value < 0.001). Furthermore, the variable customer orientation has also a direct effect on CRM adequate implementation; therefore, hypothesis 3 was confirmed.
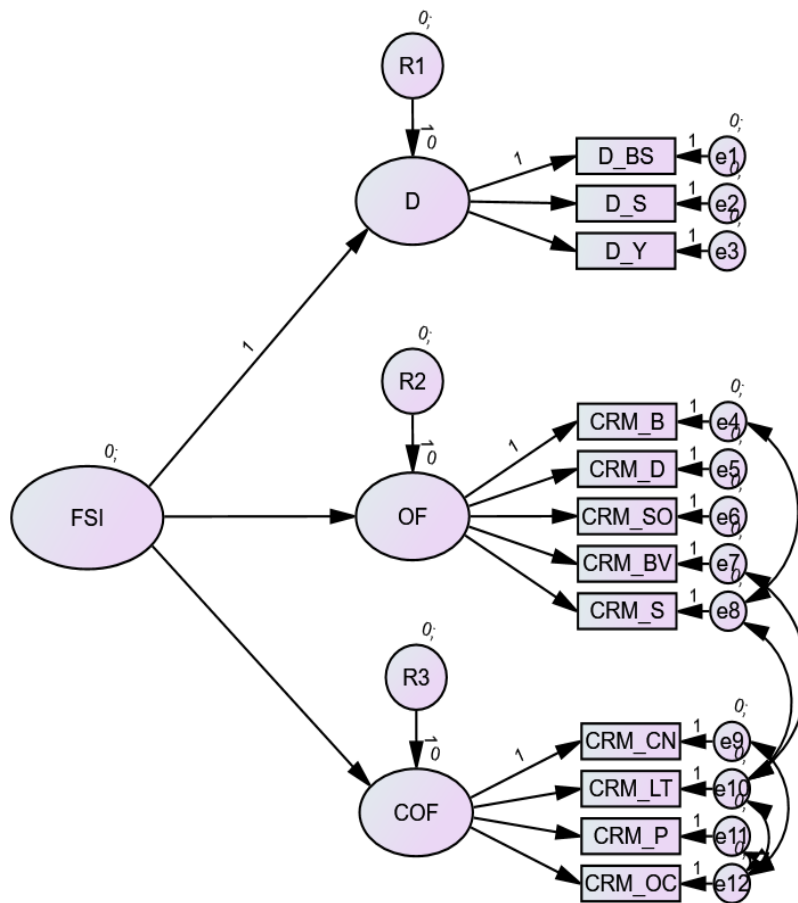

Figure1. Result of the research model for FSI

Source: own elaboration

We also have analyzed three sociodemographic variables such as sector, business size and number of years of the SME. The results show that sector affects the level of satisfaction with the implementation of CRM in the SME in line with Steel, Dubelaar & Ewing (2013). They also show that the size of the business determine inversely the level of satisfaction with the implementation of CRM in line with Hung *et al.* (2009); Lin (2006); Chen (2003); Kimberly & Evanisko (1981) which results indicates that size have significant influence on CRM adoption. On the opposite, the results differ with the literature that suggests size is not a determinant of information technologies adoption in SMEs (Levy *et al.,* 2001). Finally, as older the company is, the higher is the level of satisfaction. In summary, context clearly influences the motivation for instituting CRM, the development of goals, the way in which the CRM project is scoped, and the implementation of CRM projects, consequently, hypothesis 1 was accepted.

Table 3. Results

			Estimate
D	<---	FSI	0,4
OF	<---	FSI	-1,017
COF	<---	FSI	-0,995
D_BS	<---	D	0,282

D_S	<---	D	-0,522
D_Y	<---	D	-0,496
CRM_B	<---	OF	0,151
CRM_D	<---	OF	0,951
CRM_SO	<---	OF	0,952
CRM_BV	<---	OF	0,944
CRM_S	<---	OF	0,923
CRM_CN	<---	COF	0,983
CRM_LT	<---	COF	0,923***
CRM_P	<---	COF	0,939***
CRM_OC	<---	COF	0,944***

***p-value<0.001

Source: own elaboration

4. Conclusions

The effective implementation of customer relationship management can help to improve the competitiveness of enterprises and economic benefits, and this becomes more necessary in small businesses. The goal of this research was to identify the factors that affect an adequate level of implementation of CRM by SMEs from the viewpoint of SMEs managers. The results confirm the important role of the sociodemographic and organizational factors in the implementation of CRM. Therefore, according to the theoretical approach of the resource-based perspective, which provides a special role to organizational aspects as determinants of the firm's success; this achievement will be a function of their abilities, skills and competences in developing resources that facilitates the creation of sustainable competitive advantages (Barney, 1991; Grant, 1991). In our results only when the organization, the CRM technology and the customer orientation are aligned and integrated into the whole organization, will the firm create an organizational capability in CRM that is a source of sustainable competitive advantage. In this competitive international environment, the pressures to reduce costs and improve customer service while differentiating themselves through their actions is crucial. The CRM systems can help to increase the productivity, the level of customer satisfaction and finally can help to reach a better performance. Hence this research offers a wider understanding of the phenomenon of CRM implementation in SMEs and what factors affect the appropriate level of implementation. In doing so, this paper offers further understanding of the phenomenon surrounding the evaluation of a proper CRM implementation in the context of small business. However, the use of managers' perception to evaluate the level of satisfaction with the CRM system implemented could be considered a limitation as well as the focus on Spanish SMEs can be either a limitation to the generalization of the results obtained. Finally, regarding limitations, they are typical of an empirical research like this; the sample size is similar to previous studies but, although the response rate was reasonable, it is not so large indeed. The results presented in this paper represent the first step of research concerned with identifying and validating the factors that determine the appropriate implementation's level of CRM in SMEs. The next step will involve a wider study to explore the factors' effects and their interrelationships.

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