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Research model for measuring the impact of customer relationship management (CRM) on performance indicators

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ABSTRACT

Customer Relationship Management (CRM) has established itself as one of the fastest growing business management technology solutions in recent years, which makes it a key tool for companies that seek sustainable commercial success over time. The three CRM modules (sales, marketing, and services) are a definitive tool to obtain better business results through the customer-centred approach of modern marketing theories.

This paper establishes a research model to study the effective impact of the use of CRM. The starting point of the model is the establishment of a unified measurement of the degree of introduction of the CRM technology solution in companies, also known as CRM practices, which is expected to be related to the results obtained by the model. The objective of the study is to establish and measure the variables that determine the improvement in business performance that CRM may have, according to the degree of its introduction in the company. The model obtained could be used to measure the impact of CRM in companies in any business sector with homogeneous characteristics.

1. Introduction

Customer Relationship Management (CRM) is a technological solution that emerged in the 1970s as a tool for companies to automate the management of the company's internal sales force (Buttle, 2004). It has experienced an exponential growth since 2010 in terms of its deployment in companies in all sectors and in terms of interest as a focus of scientific research (Gil-Gomez et al., 2020; Guerola-Navarro et al.,

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2020a, 2020b). In line with the initial approach of CRM as a basic sales force management tool, Chen and Popovich (2003) defined CRM as an integration of processes, human capital and technology seeking the best possible understanding of a company's customers. The CRM technology solution has evolved from a basic initial approach to a global vision of integral management of information about customer knowledge in order to achieve more effective customer interaction (King & Burgess, 2008). CRM's current approach as a business management tool is to establish channels and methods to manage customer centred information to improve organizational performance and thereby obtain better business results (Gil-Gomez et al., 2020; Guerola-Navarro et al., 2020b).

Given that the current interest in CRM is found to be growing, the tool is essential for success in the Information Technology sector, it is essential to establish the model that permits evaluation of what the expected benefits are for companies that intend to undertake an internal CRM implementation project. Previous studies on the expected benefits of CRM (Guerola-Navarro et al., 2020a) in some sectors and groupings of companies have drawn specific conclusions about these sectors. Specifically, one of the gaps in the research area of CRM is the existence of research models that allow us to measure the impact of the use of CRM on firm performance, since there are only some models applied to specific sectors and in very specific circumstances. The goal of his paper is to establish a general research model, after reviewing the relevant literature, which can be applied to any productive sector in any geographical region, both in qualitative and quantitative studies.

In previous studies (Guerola-Navarro et al., 2020b) it has been shown that there are two global, key, critical variables to demonstrate the impact that the implementation and use of CRM has on the companies producing goods and services: "**Capacity for Innovation**" and "**Customer Knowledge Management**". Innovation capability and Customer Knowledge Management are therefore two of the critical areas for the success of the business strategy in the current marketing context (Fidel et al., 2018). Therefore, it is definitely necessary and essential to quantify the improvements in these two areas through a research model that includes the independent and dependent variables representative of them. Taking these previous studies as a starting point, we intend to create a research model in this new study that quantifies the impact that the use of CRM has on the expected benefits through the introduction of an independent variable that represents the degree of use of technology, and two dependent variables (one of them intermediate) that quantify the expected benefits in terms of improving business performance. Therefore, this paper introduces an original independent variable called Degree of Introduction of CRM or **CRM Practices**, which refers to the different degree of deployment and use that each company may be making of the CRM technology solution, and which is expected to influence the degree of impact CRM may have on the company in question. As the first dependent variable, and in turn influencing the final dependent variable, **Innovation Capability** will be considered, which has been demonstrated in several previous studies as an impact meter for CRM (Lin et al., 2010). The final dependent variable, definitive in the measurement of the impact of the use of CRM in companies in any geographic area and sector, is Organizational Performance or **Firm Performance**.

The expected outcome of this study is therefore the creation of a general research model that can be applied in different contexts to validate whether the implementation and use of CRM can lead to the improvement of business expectations through variables that represent the best adaptation of the company to a dynamic and modern market in which management of the knowledge about the client and the improvement of the capacity of innovation are basic and key for sustainable growth of the results and expectations of the company.

In the following sections, the existing literature on the use and impact associated with the CRM technological solution is reviewed, as well as the variables associated with it. Subsequently, the methodology followed to create the research model proposed in this study is presented. In the Results section, the variables identified as relevant for the measurement of the impact of using CRM on the results of the company are detailed, as well as the hypotheses and relationships proposed for its empirical validation through the questionnaire included in the Annex.

2. Literature review

The literature review begins with a review of CRM as a business management tool, defining its object and scope. Secondly, the role of Innovation and customer knowledge management is analyzed as well as its expected direct benefits, relating them to a customer-centred approach of modern business management theories.

2.1. CRM object and scope

CRM is a business management tool focused initially on the automation of the sales force (Buttle, 2004) and which has evolved towards a global concept of customer relationship management whose ultimate goal is customer loyalty and thus the improvement of the company's results (Gil-Gomez et al., 2020; Guerola-Navarro et al., 2020a, 2020b). The CRM business management technology solution was originally composed of three modules: sales, marketing and services, which are the three classic axes of the global business management of customers (Chen & Popovich, 2003). CRM was conceived, and has been maintained, with the generally accepted main objective of attracting and retaining economically valuable clients, identifying and setting aside the least profitable (Romano, 2000), which makes CRM completely aligned with modern Customer-centred business management theory (Sin et al., 2005) through its ability to analyze and plan sales, marketing and service strategies that lead the company to achieve and retain long-term partnerships. It is considered in the current dynamic and modern market that the customer-centred approach is the key to business success (Joo, 2007), for which the deployment and use of CRM provides a basic component to improve customer knowledge management, and with this management achieve customer loyalty and attain their trust and loyalty (Huang & Lin, 2005).

Due to its direct action on management processes in the areas of sales, marketing and services, CRM provides direct benefits both in terms of economic performance and commercial activity in general, as well as global business profitability. The improvement in customer knowledge management generates a better customer

experience and therefore greater customer satisfaction, which has a positive effect on the results and profitability of the company (Scullin et al., 2002), obtaining the following beneficial consequences: greater customer loyalty; a more effective marketing strategy; better customer service and support; greater efficiency and cost reduction. These benefits associated with the use of CRM are those that would justify the impact we want to measure in this paper through a research model.

Analyzing the expected benefits of using CRM, Arsić et al. (2018) establish the importance of reinforcing customer loyalty on the basic principle that in today's highly competitive market ecosystem, the ability to reduce the risk of losing the best customers is a key factor. Therefore any tool focused on the loyalty of economically profitable customers is tremendously valuable, being completely aligned with CRM global strategy (Buttle & Burton, 2002). Marketing is another area in which a high beneficial impact is expected through the use of CRM, since greater knowledge of CRM should increase the effectiveness and efficiency of marketing campaigns and actions (Yechiam et al., 2003). Better knowledge about customer needs is a key factor in their segmentation and in the adaptation of marketing campaigns and actions to these needs and expectations (Greenberg, 2001; Rong et al., 2001). The third area in which a direct, beneficial impact due to the use of CRM is expected is that of services, more specifically in customer service and support. For the best customer knowledge that CRM provides the company that uses it efficiently, a deeper understanding of the needs of the consumer is achieved, which translates into better customer service and support and with it their satisfaction and loyalty, going back to the basic marketing principle of customer loyalty and customer centred strategy (Fruhling & Siau, 2007). The last two expected benefits (greater efficiency; and cost reduction) are expected to be part of the firm performance measurement that this paper is trying to establish, as they are not directly related to the three components and axis of CRM management and processes, and in fact the literature shows them as reachable by using CRM.

2.2. CRM innovation capability

Innovation is usually defined as a set of ideas, practices or objects perceived as innovative by an individual or a group of people (Fruhling & Siau, 2007; Hsu, 2006). The capacity for innovation refers to the application of technology by an organization to develop pioneering systems, policies, software, products, processes, devices and services (Chang & Lee, 2008; Damanpour & Evan, 1984). These capabilities also integrate a company's ability to assimilate and use external data to obtain knowledge and commercial information oriented to success (Cohen & Levinthal, 1990). Lin et al. (2010) determined the effects of five CRM dimensions on innovation capabilities: product innovation, process innovation, administrative innovation, marketing innovation, and service innovation.

The capacity for innovation is considered a valuable key organizational resource to increase and maintain a competitive advantage (Hult & Ketchen, 2001), which is decisive for the company's business success through the continuous search for Customer loyalty. Panayides (2006) highlights innovation capability as the most

efficient channel to sustain and gain competitive advantage. Shane and Ulrich (2004) identify the importance of innovation capability in today's modern, dynamic market, where highly unpredictable, changing customer needs can only be met by successful companies through product and service innovation.

Fidel et al. (2018) consider that innovation processes are the most important element for an innovative system. Innovation is the key factor for successful companies to improve their organizational performance by encouraging them to create, evaluate and develop innovative and useful products, services and practices, thus creating and retaining value for internal and external stakeholders, and generating new channels of income (Dervitsiotis, 2010). Innovation capability is an especially critical success factor for small and medium-sized enterprises, due to the fierce competition in the modern market with larger firms (Gallego et al., 2013).

Therefore, the ability granted by CRM for the company to obtain and manage customer knowledge in an effective and efficient way, gathering the firm's ability for reaching analysis and exploitation of knowledge related to customer needs and preferences, is considered innovation capability (Lin et al., 2010; Ramani & Kumar, 2008; Sahay & Ranjan, 2008). Each company shows contrasting degrees of CRM development and effective use, which leads us to predict a differential, CRM-related impact on each innovation capability (Lin et al., 2010).

2.3. CRM customer knowledge management

Customer knowledge management is defined as a combination of organizational tools, practices, and soft skills focused on how to create, accumulate and transfer customer-related knowledge (Alegre et al., 2013). Customer knowledge management is perceived nowadays as one of the key factors for business success, as the customer centred management theories show how important it is to know and meet customer needs. Because of this it has been clearly established that the goal is to reach, keep, and use the best information about customer knowledge (Chang & Lee, 2008). The more effective the customer knowledge management that a firm can perform, the greater the impact it will have on the firm's marketing results (Fidel et al., 2015).

The ability to reach and manage general knowledge and customer knowledge management is considered to be one of the key factors to reach and empower competitive advantage (Chua & Banerjee, 2013), being one of the critical success factors for leading firms operating in a modern, dynamic business market. Gaining competitive advantage is definitely found to be the most important factor for retaining efficient and profitable customers in a customer loyalty culture (Arsić et al., 2018; Gorry & Westbrook, 2013).

Modern marketing theories are based on relational marketing, marketing efforts to develop and strengthen long-term relationships with customers, all enhanced through commercial efforts and energies that have been channelled into the continuous improvement of customer service, which has a high impact on customer satisfaction. (Garbarino & Johnson, 1999). The current highly globalized market demands that leading companies take on new competitive challenges, for which it is essential to put the maximum focus and effort into the management of customer relationships, and especially into customer satisfaction as the main way to survive and maximize

income, this being a point key in the CRM objective and scope as a technical business management solution (Constantinos et al., 2003). This customer-centred marketing orientation, at the heart of relational marketing, is directly related to the expected benefits of the deployment and use of CRM in companies (Bose, 2002).

CRM has become the key software technology tool for leading companies to track and analyse customer-related information, trusting that their customer relationships can be greatly improved through the use of information technology and technology management solutions. (Karimi et al., 2001). The use of CRM to adapt the productive efforts of the companies to the needs and particularities of the client is therefore key (Dewhurst et al., 1999), based on the principle that the knowledge of the needs and expectations of the clients is the basis of efficient knowledge management. CRM has become a privileged management tool focused on the identification, attraction, development and retention of successful customer relationships, with the final objective of increasing the loyalty of profitable customers, all carried out through efficient customer knowledge management (Bradshaw & Brash, 2001; Massey et al., 2001). Therefore, looking at the close relationship between CRM and customer knowledge management as key factor for a successful business management strategy, it can be concluded that CRM can definitely be considered to be relevant as a firm performance influencer (Constantinos et al., 2003; Massey et al., 2001; Romano, 2000).

2.4. Research models to measure the impact of using CRM

Our study aims to obtain a research model that can be empirically tested and that results in a measurement of the impact of CRM on firm performance.

Valmohammadi (2017) presented a research model to empirically test a framework that identifies the relationships between **CRM practices** (independent variable), **organizational performance** (dependent final variable) and **innovation capability** (dependent intermediate variable), in this case focused on 211 Iranian manufacturing companies using structural equation modelling. This study concludes that the use of CRM in manufacturing companies has a positive, significant, although weak, effect on organizational performance and innovation capacity. The results also show that a significant improvement in organizational performance is achieved as a consequence of the improvement in innovation due to CRM. Valmohammadi (2017) considered **innovation** to be a key factor of business success, seeing this as the ability to be flexible and to have a great capacity to adapt to changes in the market. Innovation has been defined as the generation, acceptance and implementation of new ideas, processes, products and services (Thompson, 1965). According to Chandler et al. (1999) innovation capability can be defined as the potential ability of an organization to position itself in an area of advancements resulting in a competitive advantage over its rivals. Lin et al. (2010) linked the use of CRM to the development of innovation capability. Regarding **organizational performance**, Valmohammadi (2017) considered it to be a measure of how well an organization achieves its market-oriented and financial goals (Li et al., 2006). There are several indicators included in the literature for measuring organizational performance: return on assets, return on investment and profit margin on sales, sales growth, market share, market share growth, customer

satisfaction and overall profitability (Akroush et al., 2011; Battor & Battor, 2010; Keramati et al., 2010; Li et al., 2006; Narasimhan et al., 2008; Sin et al., 2005). The **research model** from Valmohammadi (2017) validated the influence that CRM practices of manufacturing needs have on organizational performance and on innovation capabilities. A survey instrument was developed to test the research model, where the items and questions in the questionnaire related to CRM practices were adopted from the studies of Lin et al. (2010) and Akroush et al. (2011), while items measuring innovation capabilities were adopted from Chong et al. (2011), and items measuring organizational performance used in reviewed literature (Akroush et al., 2011; Battor & Battor, 2010; Keramati et al., 2010; Sin et al., 2005).

Li et al. (2019) propose a new model for CRM value according to Information Technology and Information Systems usage theory and "two-stage model." The empirical analysis was performed using the Harte – Hanks CI Technology Database, Compustat, and ACSI as data sources, specifically for the years 2001 to 2008, accessing information from Fortune 1000 companies in the United States of America, specifically on CRM usage and other metrics on the general use of Information Technology. The final study consisted of 387 samples of which the corresponding customer satisfaction scores, the annual financial figures and stock performance were studied. The research model included an independent variable (**CRM Usage**), two intermediate measuring variables (**Operational Benefits** and **Strategic Benefits**), a final measuring variable (**Firm Performance**), and two moderating variables (**Firm Size** and **Product Differentiation**). Six research hypotheses were established. The empirical tests carried out in the study concluded that the operational benefits of CRM were reflected in the high income of the companies per employee, which led to high profitability. CRM's strategic benefits are reflected in the high customer satisfaction of the companies, which leads to high profitability and market valuation. The study also concluded that the size of the company positively moderates the operational and strategic benefits of CRM, while the level of differentiation of industry products negatively moderates the operational and strategic benefits of CRM.

Reinartz et al. (2004) establish a research model to study the impact of the use of CRM in 1015 companies from Austria, Germany and Switzerland, through a survey launched in 2001. The model contains three study hypotheses related as independent measuring variables to the **CRM Process** (with its three primary CRM dimensions: relationship initiation, relationship maintenance, and relationship termination), with the final measurement variable **Economic Performance** (with its two dimensions: perceptual and objective), and as moderating variables to **CRM-compatible organizational alignment** and **CRM technology**. The study concluded that the implementation of CRM processes brings better organizational performance. The most powerful effect is observed during the maintenance of long-term relationships, as well as at the beginning of the commercial relationship. The effects during the termination of the relationship are very scarce. Therefore, it is concluded that CRM has some of the benefits expected by companies, making it clear that not all activities included in the development of CRM provide this level of compliance with expectations.

Kebede and Tegegne (2018) studied the effects of CRM practices on the performance of commercial banks in the Amhara region, Ethiopia. The objective of the study

was to demonstrate that the bank's performance and the level of its organizational performance could be improved by improving the level of customer satisfaction, which could be achieved by implementing and using CRM efficiently. The dimensions used in the study were Key Customer Focus, Knowledge Management, CRM organization and Technology-Based CRM. The factors used in the study as determinants in bank performance were Key Customer Focus, CRM organization, Knowledge Management and Technology-Based CRM. The study implemented a binary logistics regression model to analyze the effect of these factors on the bank's performance, concluding that customer knowledge management is the key factor that influences the bank's endorsement.

Haislip and Richardson (2017) establish a research model to compare the situation of CRM with that of the Enterprise Resource Planning (ERP) technology solution and with that of the Supply Chain Management (SCM) solution. This study used Lexis-Nexis to look for press news announcing the implementation of CRM systems, making sure that they really represented a new CRM deployment, identifying 138 companies that adopted CRM during the years 2001–2011. It was also found that this had been achieved through 87 CRM implementers. In order to demonstrate how CRM can bring organizational benefits to companies, the study investigated how the implemented CRMs affected a selection of performance variables, using a regression model to test the two hypotheses of the model. The study concludes that there were indeed numerous business operational benefits derived from the use of CRM: improvements in operational performance, operational efficiency, collection of accounts receivable and predictability of earnings. Other results tested as positive and derived from the use of CRM were increases in sales and cash flows, a reduction in operating margin, a reduction in the provision for doubtful accounts, and more accurate administration earnings forecasts.

Azad and Ahmadi (2015) conducted empirical research to determine the key factors that can determine the success of CRM implementations. For this purpose, a questionnaire on the measurement of various factors was used, which was distributed among the employees who work for the largest software manufacturer in the city of Tehran, Iran. The study concludes that there are five factors that influence the success of CRM deployment: customer relationship technologies, customer orientation, enterprise development strategies, customer services and business plans.

After identifying "firm performance" as a key variable, the need arises to review the associated risks and transaction costs associated with firm performance. Rodriguez et al. (2016) establish that in certain conditions of instability or economic crisis, also of uncertainty, the need to address risk assessment in the implementation of any project critical for firm performance is clearly relevant and key. This is even more evident in projects related to technological progress, in which the calculation of associated risks and impact assessment is key to the successful implementation of any new technological solution. On the other hand, in projects involving important technological changes for firm performance, Berezin et al. (2015) establish that the associated transaction costs must be well identified and classified, so management teams will be able to make cost-effective decisions and increase business efficiency. From the adequate study of transaction costs, a good measure of the impact of the implementation of new processes or technological solutions will thus be obtained.

In the following section, once the relevant publications for this study have been reviewed, we propose the methodology to follow to build the intended research model.

3. Methodology

After reviewing the publications about research models that relate CRM to firm performance, this section establishes the methodology to follow to create the new research model, based on those that already exist, and expanded for the field of study in this case.

The aim of the present study is to obtain a general research model to measure and assess the impact of deploying and using CRM within the companies in the market region and sector under study for all cases. For that purpose, in the Literature Review section we covered the initial need to check the published models to measure the impact of using CRM on firm performance. During the previous literature review, the direct operational benefits of using CRM in its three areas of influence and functionality (sales, marketing, and services) were confirmed.

A review of the existing research models and their measurement variables was then conducted to assess the impact of the use of CRM on the company's results (firm performance). Based on the ability of the identified research models to be used in different scenarios (sectors and geographic areas), the present paper will determine a new proposal for a research model to measure the impact of using CRM on firm performance.

After reviewing the most significant existing research models, it was concluded that all of them contain very valuable, scientifically proven scientific research models, on the basis of which we intend to establish a new general research model that can be applied to different sectors and geographical areas.

In the following Results section, each of the relevant variables that have resulted from the study of the research models previously analyzed in the Literature Review section is presented and analyzed. With these detected variables, and the analysed information flows, a model will be built with the constructs, hypotheses and interrelationships between variables.

4. Results

After reviewing the existing research models in the field of measuring the impact of the use of CRM on organizational performance, three variables were identified, which we consider to be the most appropriate to build a general model that can be applied to any sectoral and geographical context:

- **CRM Practices** (or its equivalent "degree of introduction and use of CRM in companies)
- **Innovation Capability**
- **Firm Performance** (or its equivalent "organizational performance")

Now, we proceed to review the characteristics of these three variables to confirm whether they can form part of the general research model that we hope to build.

4.1. CRM Practices

Reviewing the existing studies on how to measure the degree of introduction of CRM in companies is considered a priority initial step. The search in the scientific literature does not provide conclusive results on the existence of previous studies dealing exclusively with the degree of introduction of CRM in companies under study. However, within the studies concerning the impact of CRM on organizational performance, the measurement of the degree of introduction of CRM appears to be reflected and valued, in general by means of the concepts "CRM Practices" and "CRM Usage".

Valmohammadi (2017) clearly describes the importance of the degree of intrusion and use of CRM in the measurement models of its impact on business results and does so by including an independent variable called "CRM Practices", which is the starting point of its research model. Similarly, Li et al. (2019) include an initial independent variable called "CRM Usage" in their model, which is confirmed to be assimilable in the concept of "CRM Practices" by Valmohammadi (2017). Reinartz et al. (2004) also considers that the degree of use of CRM is important in assessing its impact, but breaks down this variable into three stages or dimensions: relationship initiation, relationship maintenance, and relationship termination. Kebede and Tegegne (2018) use the same concept of "CRM Practices" as Valmohammadi (2017) to establish an assessment of the degree of introduction and use of CRM in companies. Haislip and Richardson (2017) do not mention the use of variables measuring the degree of introduction of CRM, since they focus on knowing how many implementations are made in a period of time and region, regardless of the level of introduction. Finally, Azad and Ahmadi (2015) also consider the assessment of the degree of introduction and use of CRM as a starting point to assess its impact on performance.

In our study, then, and given that in all previous studies it appears as a relevant starting point, we use the variable "**CRM Practices**" as an independent variable that measures the degree of introduction of CRM into companies.

4.2. CRM innovation capability

There are a variety of studies on Innovation Capability in the literature, as it is one of the most frequent research topics. Since our field of study is limited to the scope of the implementation and use of CRM, considering all available literature on Innovation Capability, we focus on and review those studies in which these two variables are related: CRM Practices/Usage and Innovation Capability. In all the studies reviewed, the Innovation Capability variable appears to be essential in the study of the impact of CRM on firm performance, so it was concluded that it should be part of the general research model to be built.

Innovation Capability appears in Valmohammadi (2017) in two valuations, as a dependent variable derived from the use of CRM, and as an intermediate variable to

measure its direct impact on firm performance. Li et al. (2019) do not directly use the Innovation variable, but do it indirectly through the Product Differentiation variable, a direct consequence of Innovation. The same happens in the case of Reinartz et al. (2004), Kebede and Tegegne (2018), Haislip and Richardson (2017), and Azad and Ahmadi (2015), where for all of them the capacity for innovation is reflected through the CRM Technology variable.

The fact that "**Innovation Capability**" is considered important in all the studies, but that it is only reflected directly in one of them, leads us to think that it may be interesting to include it in our study directly and independently and as its own entity, to determine if its impact on firm performance derived from the use of CRM is relevant or not.

4.3. CRM Firm performance

In an attempt to measure the impact of CRM on the company's overall business performance, the first step should be the initial search for existing performance studies targeted at companies that use CRM. This search is considered to be initiated by searching the scientific literature using the "CRM" and "firm performance" filters. The hope of the research is to find not only the way to measure firm performance but also the way to measure the degree of introduction of CRM in the company, with the purpose of using it in the research conducted in the current sector under study in this paper. As has been verified in the previous sections, the studies on Firm Performance associated with the use of CRM, are very recent. Only one of them dates to 2004, the rest between 2015 and 2019, which indicates growing interest in these research models.

In the reviewed models, though with different nomenclatures, the final objective is to measure the impact that the use of CRM has on the metrics that evaluate the organizational performance of the companies in a certain sector and geographic area. This impact is measured in different models through different variables, and with different meters, but all these variables and meters are closely related. Valmohammadi (2017) calls this concept of impact on results "Organizational Performance", as does Kebede and Tegegne (2018), a concept comparable to what Li et al. (2019) called "Firm Performance". Reinartz et al. (2004) uses the "Economic Performance" concept. Haislip and Richardson (2017) use a selection of performance variables.

Once the definitions, characteristics, and meters of each of the impact measuring variables of the use of CRM in the company's performance were verified, we found that the one that represents the concept of performance measurement in the most global way is that of "**Firm Performance** ", which is what we include consistently in our research model.

4.4. Research model and Hypothesis

The existing research models in the scientific literature were reviewed, and it was verified that the most relevant variables that were globally represented in the study of the impact of the use of CRM on business performance were "CRM Practices", "Innovation
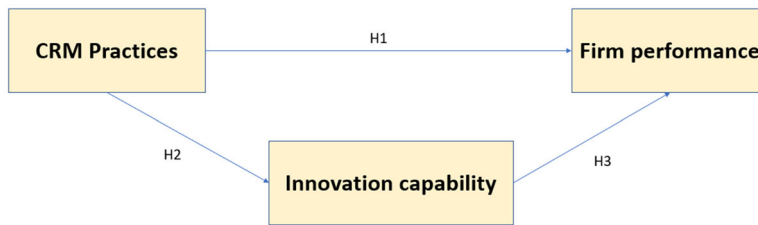
Figure 1. Conceptual research model for CRM impact on firm performance. Source: The authors (self-made).

capability" and "Firm Performance". The proposal in this paper is to use the conceptual research model in Figure 1 as a methodology to study the impact of CRM use.

In this research model there is an independent variable called "CRM Practices", representing a measurement of the different degrees of introduction that CRM could have in each enterprise, which is expected to be relevant not only due to a direct influence on "Firm Performance" (as a measurement of the organizational performance) but also an indirect influence through the intermediate variable "Innovation capability". Based on the expected close relationships that previous research models have shown as validated in their particular study environments, we propose the following study hypotheses.

H1. CRM practices have a significant and positive impact on firm performance.

Romano (2000) states that CRM was conceived and enhanced during its development, with the main, global objective of attracting and retaining economically valuable clients, for which its working power lies in identifying and separating less profitable customers, which positions CRM in line with modern customer-centric business management theory (Sin et al., 2005). This suggests, and should be demonstrated by validating this hypothesis, that its ability to analyze and plan sales, marketing and services strategies will lead the company to obtain and maintain long-term partnerships, and thereby improve firm performance. Joo (2007) considers that a client-centred approach is the key to business success, since the dynamism of the modern market demands a high business capacity to adapt to the environment, which is the assumption that CRM provides. Again, it is expected, through the validation of this hypothesis, that CRM can lead to better customer knowledge management, and thereby create long-term partnerships and achieve maximum customer-loyalty (Huang & Lin, 2005). The originality of this work is that it not only tests the hypothesis that CRM has an impact on firm performance, but that through this hypothesis it links firm performance (Nakata et al., 2008) to the degree of introduction of CRM or CRM Practices (Valmohammadi, 2017).

H2. CRM practices have a significant and positive impact on Innovation Capability.

Innovation has been defined as a set of ideas, practices or objects perceived as innovative by an individual or a group of people (Fruhling & Siau, 2007; Hsu, 2006). More specifically, in this study, innovation capacity refers to the application of technology in an organization to develop pioneer systems, policies, products, processes, devices and services (Chang & Lee, 2008; Damanpour & Evan, 1984). Considering

the topic of business management solutions that concern us in this paper (specifically CRM) it can also be said that these capabilities also integrate the ability of a company to assimilate and use external data to obtain commercial knowledge and information oriented to success (Cohen & Levinthal, 1990). In today's modern, changing, dynamic market, innovative capacity is vital to enhance the competitive advantage of companies (Hult & Ketchen, 2001) and is essential for business success. The needs of customers, unpredictable and changing, can only be met through innovation (Shane & Ulrich, 2004). With this hypothesis, we want to demonstrate that indeed, and intimately linked to the degree of introduction of CRM (referred to in our model as "CRM Practices"), there is a significant and positive impact due to the use of CRM in the degree of innovation of the company. Lin et al. (2010) already predicted a differential impact related to CRM in each innovation capacity, which we intend to demonstrate with our research model.

H3. Innovative Capability has a significant and positive impact on firm performance.

The capacity for innovation is a particularly critical success factor for small and medium enterprises, due to fierce competition with larger companies in the modern market (Gallego et al., 2013). It has been mentioned in this paper that the implementation and power of innovation processes are the most important element for a successful company (Fidel et al., 2018; Lin et al., 2010; Ramani & Kumar, 2008; Sahay & Ranjan, 2008). Innovation is expected to be one of the key factors for successful companies to improve their performance by encouraging them to create, evaluate and develop innovative and useful products, services and practices, enhancing the long-term partnership with interesting agents for the business of the company (Dervitsiotis, 2010). It is intended with this hypothesis to demonstrate that the capacity that CRM has to help the company obtain, manage, and efficiently exploit customer knowledge (its needs and preferences), definitely and positively has an impact on the performance of the firm.

4.5. Measures and construct validation

We rely on the existing models in the scientific literature, already referenced above, to establish the necessary constructs for the research model proposed in this paper as global and definitive. To construct the research model, three constructs were considered: CRM Practices, Innovation Capabilities and Firm Performance. Each of these constructs measures multiple items by means of scales, all of them evaluated using a five-point Likert scale from "totally disagree" to "totally agree" (Albaum, 1997).

The construct for **CRM Practices** can be measured though 5 items, following Valmohammadi (2017):

- Information sharing
- Customer involvement
- Long-term partnership
- Joint problem-solving
- Technology-based CRM

Valmohammadi (2017) developed a survey instrument, previously validated and accepted as usable in scientific studies, and that will be used as the basis of this present empirical study. These items were selected because the general focus that Valmohammadi (2017) uses in his study is very similar to the present one. There are not many more models to use as a basis considering the articles published previously, so we can assume that this approach is the most fitting one.

The second construct is **Innovation Capability**. Hurt et al. (1977), proposed a scale of measurement of the capacity of innovation composed of 20 items, relying on the study of Likert self-measurement scales as they are easy and cheap to administer, as they are able to measure the capacity of innovation in various innovation contexts as a global measurement strategy. Other scales that have been previously validated and presented as usable are the one from Hult et al. (2004) and the one from Hurley and Hult (1998), both of them in the same line as the one from Hurt et al. (1977). Calantone et al. (2002) developed a scale for measuring the capacity of innovation composed of 6 more specific items than those of Hurt et al. (1977). The scale by Calantone et al. (2002) was validated in a sample of 400 vice presidents of research and development in various industries in the United States, which is why it is considered perfectly valid for use in the present study. The items that make up the scale by Calantone et al. (2002) which we are going to use in our study are:

- Our company frequently tries out new ideas
- Our company seeks new ways to do things
- Our company is creative in its methods of operation
- Our company is often the first to market with new products and services
- Innovation in our company is perceived as too risky and is resisted
- Our new product introduction has increased over the last 5 years

Also, in this case, to evaluate the Innovation Capability construct, we will use the survey previously validated and tested by Calantone et al. (2002).

Regarding the construct of **Firm Performance**, there is much published literature on constructs and validated items in more specific studies and also in more general ones. Dawes (1999) and later Zegarra Saldaña (2014) based on Dawes (1999), analyse and study different subjective measurements of organizational performance in market-oriented studies. After reviewing the literature, the construct and the items chosen by Zegarra Saldaña (2014) are the same that we chose, as the approach is comparable to that of our study, and it is the one proposed by Nakata et al. (2008). The Nakata et al. (2008) scale uses subjective measures to measure organizational performance. The scale compares the performance of the organization with that of other competitors and is composed of the following items:

- The quality of the product or service.
- The success of new products or services.
- The customer retention rate.
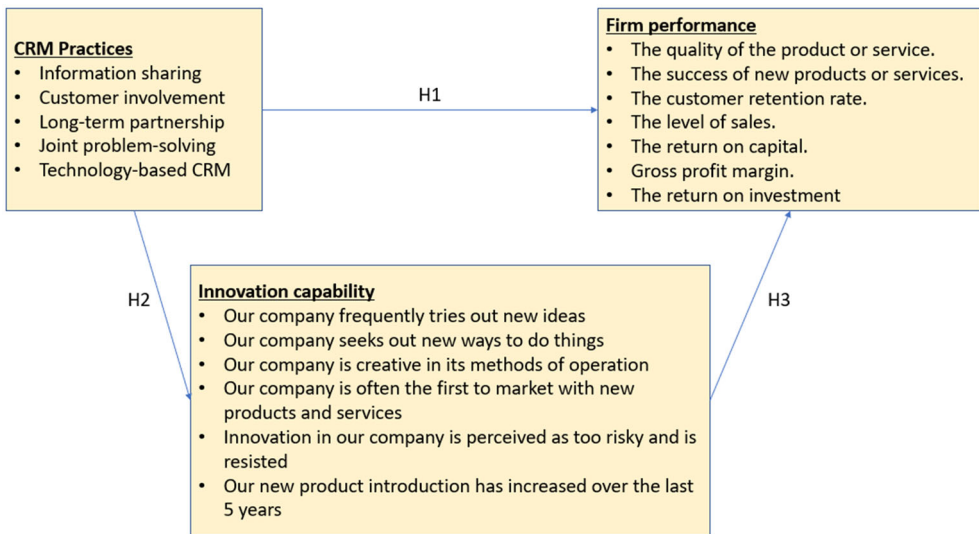- The level of sales.
- The return on capital.

Figure 2. Research model for CRM impact on firm performance. Source: The authors (self-made).

- Gross profit margin.
- The return on investment

The instrument that we will use to measure the items of the Firm Performance construct is the survey proposed by Nakata et al. (2008), which was validated by 189 senior marketing managers of business units in various industries, and which permits a subjective evaluation of market share, consumer retention, product quality, gross profit margin, return on investment and return on capital

With all these considered variables, items and measure indicators, the proposed research model is the one presented in Figure 2.

With the proposed model, based on constructs and items validated by different previous studies, the next step proposed in this paper is to determine the research methodology. The final purpose will be to establish, together with the research model, a research methodology that permits testing the model in different productive sectors, geographical areas, and groupings of companies, and thereby draw conclusions about the impact on firm performance that the implementation and use of CRM in the companies may have, all this in function of the degree of introduction of CRM in these firms.

4.6. Research methodology

Hernández Sampieri et al. (1996) define two types of approach as to the possible way to face the study and testing of a research model: a quantitative approach and a qualitative approach. Hernández Sampieri et al. (1996) define the "**quantitative** approach" as one that uses data collection to test hypotheses based on numerical measurement and statistical analysis, in order to establish behavioural patterns and test theories; on the other hand, it also defines the "**qualitative** approach" as one that uses data

collection and analysis to refine research questions and reveal new questions in the interpretation process. Both approaches employ careful, methodical, empirical processes in their effort to generate knowledge, so the previous definition of research applies to both equally. However, although quantitative and qualitative approaches share these general strategies, each has its own particular characteristics. Finally, there are "**mixed** approaches", in which evidence from numerical, verbal, textual, visual, symbolic and other data is used to understand problems in science. Deciding what the study approach will be in each case will depend on the approach of the problem and the circumstances surrounding it, as well as the recommendations of the precedents of studies in the same field (Hernández Sampieri et al., 1996).

Regarding sample and data collection, a survey instrument was developed to test the research model, again trying to use a general context that permits the research model and the survey to be used in any productive sector, geographical area, or grouping of companies.

This survey will be used as the main tool to test the research model in case we have a significant sample of work items within the sector under study. In case of not having enough work elements, it will be used as the first step to a mixed approach, in which the quantitative assessment of the results of the sample will be analysed, considering each particular case.

The survey was carried out by sending the **questionnaire** included in the Appendix of this work by email and regular mail. The questionnaire was constructed using a five-point Likert scale (Albaum, 1997). Depending on the sector or group of companies under study, their special characteristics, and the degree of involvement of the researcher with them, the questionnaire was complemented with a cover letter of introduction and thanks, and a phone call in case it was considered necessary to favour the response .

Results

The objective of this paper, and therefore the expected result, is a research model that can be used to measure and evaluate the impact (measured in firm performance) that the implementation and use of CRM can have on companies in certain sectors or functional or geographical groupings, all based on the degree of introduction and use of CRM in these companies.

Based on similar previous studies on the measurement of the impact on organizational performance that the use of the CRM technological solution may have, and also based on modern considerations derived from studies on innovation capacity, customer knowledge management, a research model was proposed with global characteristics of general applicability to almost any productive environment, as was the main initial objective of this study.

The proposal that is made in this study is the use of the most appropriate research methodologies for each group of companies (Hernández Sampieri et al., 1996), which through the research model proposed in this paper and through the questionnaire also proposed in the Annex, it should be efficient in assessing the impact of the different levels of CRM used in companies, measured in terms of firm performance.

Subsequent studies will corroborate and make sense of this study, through its effective application to different sectors or groups of companies.

5. Conclusions

This paper sought to verify initial expectations about the expected beneficial impact of the use of the technological solution CRM on business results. For this purpose, an extensive review was made of various concepts that identify both the implementation and use of CRM, and also the variables that identify the results or measurements of organizational performance.

Once the literature on basic concepts for this study was reviewed, specifically on CRM, innovation and innovation capacity, organizational performance, firm performance, customer knowledge management, among others, it was found that expectations about the impact of CRM on firm performance may be consistent with the effective and proven results in the companies that have implemented and are using CRM internally. These companies are expected to be effectively using CRM to manage their relationships with customers through the three CRM modules (sales, marketing, services and customer service), but this is not always totally proven because of the different degree of use of CRM that each company may be carrying out; which is why it is considered so important to add an independent variable about CRM Practices that refers to the degree of use.

Based on these expectations, apparently confirmed as probable and testable by other previous studies carried out in certain particular and specific environments, it was considered essential to build a new research model applicable in any environment, appropriate for any group of companies from different sectors or business groups, in order to have a tool to measure the impact on firm performance that derives from the different degrees of use of CRM in companies. This model includes variables, items, and measurement scales validated in some previous models, but in this case, they were structured in a different way and with contributions from several different sources, which makes it novel and valid at the same time. It is valid because in its constituent parts it has been corroborated in specific environments where they were applied separately in previous studies. It is novel because it incorporates different modules that have never before been related to each other through variables collected from different study environments and that are now presented in a new joint model.

The originality and value of this new research model comes from the fact that it is prepared to be used in different environments, with the hope of validating how and to what degree each of the items in the CRM Practices construct have an impact on the items of the final construct (Firm Performance) and the intermediate construct (Innovation Capability), and it is open to any sector or group of listed companies. This is a global, general research model prepared to be adapted and used in any case and any circumstances. As future lines of research, establishing adaptation channels for the research model and the validation questionnaire is proposed, depending on the sectors or circumstances of the study, adopting additional variables or components based on the requirements validated by the environment review.

Regarding limitations, the proposed research model and questionnaire aims to be general and open to any sector, so it could be expanded and adapted in each case depending on any particular circumstances. It is fully accepted that there are additional factors such as the associated risks and transaction costs that may influence the evaluation of firm performance.

Disclosure statement

No potential conflict of interest was reported by the authors.

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Appendix

Questionnaire used to validate the research model.

1.- **Personal profile of the respondent**. Please mark (with X) the option that fits your personal characteristics in each of the following questions:

Gender:	☐ Male	☐ Female	
Age:	☐ 25 to 35 years	☐ 35 to 45 years	☐ more than 46 years
Education level:	☐ Primary	☐ Secondary	☐ University/High School

Years in the company:☐ 1 to 5 years☐ 5 to 15 years☐ more than16 years

2.- **Business profile of the organization**. Please mark (with X) the option that fits your personal characteristics in each of the following questions:

Number of employees:	☐ 1 to 10	☐ 11 to 50	☐ 51 to 250	☐ more than 250
Annual Billing (million €):	☐ 0 to 1	☐ 1 to 10	☐ more than 10	
Property Structure:	☐ family	☐ group	☐ multinational	☐ others

3.- **CRM Practices**. Please indicate the degree of agreement or disagreement with the following statements regarding the situation of your company:
- If you totally agree, select 5.
- If you agree, select 4.
- If you feel neutral, select 3.
- If you disagree, select 2.
- If you strongly disagree, dial 1.

CRM Practices	1	2	3	4	5
3.1.- Long-term partnership. Our company actively stresses on customer loyalty or retention programs.					
3.2.- Information sharing. Our company shares market information with customers (promotion information and competitive product information).					
3.3.- Customer involvement. Our key customers are involved in NPD (New Product Development) activities with us.					
3.4.- Joint problem-solving. Our key customers work with us to overcome difficulties (inventory management, delivery delay and logistics management).					
3.5.- Technology-based CRM. Our company has the right software to serve our customers.					

4.- **Innovation Capability**. Please indicate the degree of agreement or disagreement with the following statements regarding the situation of your company:
- If you totally agree, select 5.
- If you agree, select 4.
- If you feel neutral, select 3.
- If you disagree, select 2.
- If you strongly disagree, dial 1.

Innovation Capability	1	2	3	4	5
4.1.- The organization usually generates new ideas.					
4.2.- Our company looks for new ways of doing things.					
4.3.- The company is creative in its methods of operation.					
4.4.- Our company is usually the first to introduce new products and services to the market.					
4.5.- Innovation in our company is perceived as a very risky activity.					
4.6.- The introduction of new products has increased in the last 5 years.					

5.- **Firm Performance**. Please evaluate the following aspects from 1 to 5 in relation to your competitors. Please mark:

- 5 if it is Outstanding, much better than the competition
- 4 if it is a little better than the competition
- 3 if it is just like the competition
- 2 if it is a little worse than the competition
- 1 if it is very bad, the worst in the industry.

Firm Performance	1	2	3	4	5
5.1.- The quality of the product or service.					
5.2.- The success of new products or services.					
5.3.- The customer retention rate.					
5.4.- Sales level.					
5.5.- The return on capital.					
5.6.- The gross profit margin.					
5.7.- The return on investment.					