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Garrido-Moreno, A, Lockett, N and Garcia-Morales, V (2015) Exploring the role of knowledge management practices in fostering customer relationship management as a catalyst of marketing innovation. *Baltic Journal of Management*, 10 (4). 393 - 412. ISSN 1746-5265

<https://doi.org/10.1108/BJM-10-2014-0166>

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Exploring the role of knowledge management processes in a CRM innovation

1. Introduction

The concepts of CRM (Customer Relationship Management) and knowledge management have gained wide attention in both business and academia (Gebert et al., 2003). CRM can be defined as a strategic approach to managing customer relationships in order to create customer and shareholder value through the appropriate use of IT, data and customer knowledge (Payne and Frow, 2005). Knowledge has become a key strategic factor in business success, because the firm's capability to create and utilize knowledge represents the most important source of competitiveness (Grant, 1996). Businesses that can efficiently capture the knowledge embedded in their organizations and deploy it into their operations, productions and services could gain a sustainable competitive advantage over their competitors. Knowledge management is rapidly becoming an integral business activity for organizations (Grover and Davenport, 2001) and it consists of a dynamic and continuous set of processes and practices directed to identifying and leveraging the collective knowledge in an organization to help the organization compete (Alavi and Leidner, 2001). Although knowledge management has become a widely accepted business practice, companies still struggle to measure its real impact on their economic performance (Omerzel et al., 2011).

Within the broad domain of knowledge management, customer knowledge has started to draw increased attention. Customer knowledge is a critical asset, and gathering, managing, and sharing customer knowledge is a valuable competitive activity for organizations. Customer Relationship Management (CRM) involves a group of information systems (IS) and business activities that enable organizations to contact customers and collect, store and analyze customer data to provide a comprehensive view of their customers (Khodakarami and Chan, 2014). Customer knowledge management is considered as the driving force behind CRM performance, because customer knowledge is needed to fully appreciate customer needs and behavior and to be able to personalise products and services accordingly (Salojärvi et al., 2010). CRM is strongly dependent on customer knowledge management, and obtaining customer-related knowledge is fundamental to determining CRM objectives (Stefanou et al., 2003). Therefore, Knowledge is widely considered the cornerstone of any CRM initiative. However, there is no integrated conceptual framework to guide companies to its successful implementation.

Over the last decade, companies have attempted to integrate their CRM and knowledge management efforts because they have realized that knowledge management plays a key role in CRM success (Dous et al., 2005). The relationship of the discipline of CRM innovations with IT and knowledge management is being recognized as an important research field at present (Khodakarami and Chan, 2014; Romano and Fjermestad, 2003). Several studies have focused on comparing CRM and knowledge management concepts and practices (Du Plessis and Boon, 2004; Zablah et al., 2004). Others have discussed the interaction between knowledge management and customer knowledge (Campbell, 2003; Chen and Su, 2006), and based on the combined

potential of CRM and knowledge management, there have emerged theoretical models from the integration of both concepts (CKM models) (Gebert et al., 2003; Tiwana, 2001).

Although knowledge management and CRM have become a topic of growing interest in the literature during the last ten years (e.g., Du Plessis et al., 2005; Donate and Guadamillas, 2011; Salojärvi et al., 2010), it is not yet understood what are the main drivers of knowledge management processes, and also what is the impact of knowledge management on CRM performance. Moreover, the existing research on CRM and knowledge management is primarily conceptual and descriptive in nature, and empirical research confirming the real impact of knowledge management processes when developing a CRM innovation is lacking. In addition, to advance research on this topic has also relevant implications for practice, because companies all over the world are making considerable investments in implementing knowledge management processes and CRM, they are not achieving the expected results and there is growing skepticism about the real value of these initiatives (Reimann et al., 2010; Xu and Walton, 2005). If organizations fully comprehend what drives knowledge management and CRM, they would be able to implement them successfully, creating value for their companies. In our study, we will empirically examine those drivers, so companies can understand what factors they need to improve in order to develop efficient knowledge management processes and CRM innovations.

In order to shed light on the topic and address the existing research gap, the objective of this study is to validate a research model examining the drivers of knowledge management processes and linking those processes with CRM performance. Considering that the key factors that contribute to effective knowledge management are human and technical (Donate and Guadamillas, 2011), we will include organizational variables, technological readiness and Social Media use as main drivers or facilitators of knowledge management processes. This research seeks to answer two main research questions: (1) Which organizational and technical factors are the drivers of knowledge management processes? (2) Are knowledge management processes antecedents of the performance of a CRM innovation?

The contribution of this empirical study therefore is two-fold. Firstly, the investigation increases our understanding of the effective drivers of knowledge management processes, highlighting the leading role of organizational variables and technological readiness. Secondly, it identifies the direct effect of knowledge management on the performance of a CRM innovation, confirming the synergistic potential of both initiatives.

The paper is organized in five sections. After the introduction, the research model is explained and the research propositions are developed. Next, the research methodology is presented, including sample description, research instrument and statistical methods. Data analysis results are detailed in the fourth part. Finally, research results are discussed from both theoretical and practical standpoints, and the paper concludes with the conclusions, implications and limitations of the study.

2. Theoretical framework and research hypotheses

2.1 CRM as an IT-related innovation

Nowadays, increasing competition and decreasing customer loyalty have led to the emergence of concepts promoting the nurturing of customers relationships; and Customer Relationship Management (CRM) has become one of the hottest topics in the fields of business strategy and information technology. CRM refers to all business activities directed towards initiating, establishing, maintaining, and developing successful long-term relational exchanges (Ozgener and Iraz, 2006). This implies the use of customer knowledge and technologies to help firms generate customized offerings on an individual basis, in order to enhance and maintain quality relationships with all the parties involved (Nguyen and Mutum, 2012).

CRM involves the strategic application of people, processes and technology to improve and sustain profitable relationships with customers and partners, thus those initiatives are technology-intensive and are based on a great deal of knowledge. CRM technology infrastructures enable firms to harness the power of databases, data mining, and interactive (e.g., Internet) technologies to collect and store unprecedented amounts of customer data and build knowledge that is crucial to effective relationship management (Zablah et al., 2004). CRM not only implies acquiring and continuously updating knowledge about customer needs, motivations and behavior, but also applying this knowledge to continuously improve performance, through a process of learning from experience (Ozgener and Iraz, 2006). Consequently, knowledge management processes will be the cornerstone to achieve CRM success.

CRM could be considered to be a cross-functional business strategy that integrates diverse functions in the company (marketing, sales, customer service, human resources and IT – among others) in order to maximize the profitability of customer interactions (Chen and Popovich, 2003). It is useful for companies in that it allows them to detect changes in customer needs, personalize their service, differentiate themselves from competitors, and create a competitive advantage (Jain, 2005). Managing customer relationships effectively and efficiently offers numerous benefits to organizations, and CRM initiatives – when properly implemented – have resulted in increased competitiveness for many companies, as evidenced by higher revenue and lower operational costs (Chen and Popovich, 2003).

In management literature, CRM is commonly considered as an IT-related innovation in organizations because it has re-engineered the traditional marketing activities and has increasingly become important for remaining competitive in terms of nurturing long-term relationships with customer (Wu and Wu, 2005). Implementing CRM requires a cross-functional integration of processes, people, operations, and marketing capabilities, so it entails a major change in the way companies organize themselves, evolving from product-based to customer-based structures (Payne and Frow, 2005; Ryals and Knox, 2001). It involves a significant organizational change, because new processes, technology, and information sharing procedures need to be implemented at the enterprise-level (Shum et al., 2008). Rogers defines innovation as ideas, action programs, or objects appealing as new things to individuals or organizations (Rogers, 1995). Assuming that CRM involves introducing relatively comprehensive and complicated business processes and activities, it is widely

regarded as a new business strategy enabled by IT for improving the competitiveness of companies (Ko et al., 2008).

Considering that an organizational innovation is defined by the Oslo Manual (European Commission, 2005) as the introduction of significantly changed organizational structures; the implementation of advanced management techniques; or the implementation of new or substantially changed corporate strategic orientations; in the present study we will consider CRM as an organizational innovation enabled by IT. We assume it as a strategic IT-related organizational innovation focused on managing customer relationships to create both customer and shareholder value.

Assuming that knowledge management has been highlighted as the major subprocess of CRM, exerting thus a significant impact on its performance (Chen and Ching, 2004); in this section we will build an integrative research model exploring what are the main drivers of knowledge management processes in the context of CRM; and analyzing also the impact of those processes in the performance of a CRM innovation.

2.2 Organizational variables as drivers of knowledge management processes

Based on the literature review, we will include organizational variables as the first driver or facilitator of knowledge management processes. These processes have proven to be highly dependent upon the technological and human resources of a firm; and organizational variables are considered as a fundamental enable of knowledge sharing (Zablah et al., 2004). Knowledge management capabilities are embedded in organizational processes, so its effectiveness will depend on how knowledge is integrated within the firm's existing processes, structures and employees. In the end, an organization depends on its employees to collect and store customer information (Alavi and Leidner, 2001). The organization also depends on its employees to utilize the stored customer data, developing new practices based on analysis of the existing knowledge and so improving the customer experience (Shang and Lin, 2010). Thus, building a positive organizational climate seems crucial to motivate employees to work together and exchange knowledge (Palacio-Marques et al., 2014).

Among the main organizational variables that could contribute to generate a favorable climate for knowledge management we will include the following in our empirical analysis: appropriate reward system; employee commitment, top management support; and organizational structure. The organization's system for rewards can determine the effectiveness of knowledge-management activities, as this enhances staff involvement and commitment with knowledge-sharing initiatives. Incentive systems would motivate workers to take the time to generate new knowledge and to share it, breaking down functional barriers and ensuring adequate focus on customer interactions (Jayachandran et al., 2005). The role of top-management support is also fundamental. Leaders should devote themselves to promoting a corporate mindset that emphasizes co-operation and knowledge sharing across the organization. They should also contribute to the creation of an environment in which knowledge creation and cross-boundary learning can flourish (Wong and Aspinwall, 2005). In a similar vein, an appropriate organizational structure can foster knowledge management processes

through shaping patterns and frequencies of communication among organizational members, and stimulating interactions and knowledge sharing (Zheng et al., 2010).

Previous empirical studies also confirmed this link between organizational variables and knowledge management processes. Collins and Smith (2006), drawing on a sample of high-technology firms, observed that commitment-based human resource practices, such as incentive or training policies, were positively related to the firm's capability to exchange and combine knowledge. Donate and Guadamillas (2011) confirmed how organizational facilitators (organizational culture, leadership or human resource practices) were essential in order to capitalize on efforts made in knowledge management initiatives. Based on this, we propose the following hypothesis:

Hypothesis 1. Organizational variables will have a positive effect on knowledge management processes

2.3 Technological readiness as drivers of knowledge management processes

Technological readiness refers to the level of technological resources that are available to an organization (Croteau and Li, 2003). We include it as relevant driver in our study because previous literature has widely support that an important prerequisite to developing knowledge management capabilities rests in the information systems infrastructure of an organization (Alavi and Leidner, 2001).

It is indisputable that information technologies such as document management systems, information retrieval engines, relational and object databases, groupware and workflow systems, and data mining tools can facilitate knowledge management processes (Wong and Aspinwall, 2005). Companies have thousands of customers today, and one of the principal ways to gain relevant knowledge about them is through the use of specific technological tools. The use of CRM technology to capture data and information (such as customer names, buying profiles, problems and complaints, all retained in the CRM database) is a first step in the process of getting to know customers better. CRM systems accumulate, store, maintain, and distribute customer knowledge throughout the organization, so they enable firms more easily to acquire, warehouse, analyze, transfer and use knowledge about customer behaviour (Salojärvi et al., 2010; Zablah et al., 2005). Using these technologies at a cross-functional level, firms can obtain critical knowledge to help coordinate sales, marketing, and customer-service departments to better and faster serve customers' needs (Nguyen et al., 2007).

Previous empirical studies also recognized the relevance of the technological readiness of a company as a facilitator of knowledge management practices (Chen and Chen, 2004). In this vein, Croteau and Li (2003) observed that possessing a strong information technology infrastructure, integrated across the different functional areas, was a key prerequisite to developing knowledge management capabilities, because they rely strongly on this infrastructure to capture, manage, and distribute customer knowledge throughout the organization. Thus, we propose the following hypothesis:

Hypothesis 2. Technological readiness will have a positive effect on knowledge management processes

2.4 Social Media use as driver of knowledge management processes

Finally, we will consider Social Media use as a third facilitator of knowledge management processes. In the last decade, Social Media has emerged as a strategic process, putting the customer at the center of the organization (Smith and Zook, 2011). One of the most accepted definitions of Social Media is the one proposed by Kaplan and Haenlein, (2010), which considers it as a group of Internet-based applications that build on the ideological and technological foundations of Web 2.0, and that allows the creation and exchange of User Generated Content. Social Media includes to a set of online tools that supports social interaction between users, facilitating the creation and sharing of knowledge, and transforming monologue (company to customer) into dialog (Hansen et al., 2011).

Firms are facing a radically different landscape nowadays, and technological advancements have created a demand for more interaction between the firm and its customers through blogs, internet forums and social-networking sites (Nguyen and Mutum, 2012). The use of Social Media tools support the democratization of knowledge and information, transforming individuals from mere content consumers into content producers (Berthon et al., 2012; Kaplan and Haenlein, 2010). Engaged customers become partners who collaborate with sellers in the value adding process to better satisfy their needs as well as the needs of other customers. This active dialogue can notably improve customer knowledge management, allowing the understanding of customer needs and facilitating modifications to existing products or the development of new products to better satisfy their needs (Sashi, 2012).

The use of these technologies represents a revolutionary new trend for companies (Kaplan and Haenlein, 2010), and Social Media technologies are increasingly being integrated with CRM technologies in order to gain new levels of customer insight, engaging customers in collaborative conversations that allow personalization of services based on the knowledge generated (Greenberg, 2010). Between the main types of Social Media tools, similar to previous studies, we will include the following in our empirical analysis: instant messaging, blogs, microblogs (e.g. Twitter), social networking sites (e.g. Facebook), review sites (e.g. Tripadvisor); and photo and video sharing sites (e.g. Youtube) (Hansen et al., 2011; Berthon et al., 2012).

Although the introduction of Social Media tools and its organizational use is a recent phenomenon yet, Trainor et al. (2014) observed that firms with high social media technology use developed greater knowledge management capabilities (in terms of knowledge generation, dissemination and application) than their counterparts with low social media technology use. Consequently, we propose the following hypotheses:

Hypothesis 3. Social Media use will have a positive effect on knowledge management processes

2.5 The impact of knowledge Management processes in CRM performance

The challenge when developing a CRM innovation is to identify and track profitable customers, and to develop strategies to satisfy and retain them, building valuable relationships (Boulding et al., 2005). To this end, the acquisition, dissemination and utilization of customer knowledge will be the cornerstone of a CRM initiative, allowing the detection of relevant buying patterns, and market segments comprising customers with specific needs. Knowledge-management processes enable companies to collect and store unprecedented amounts of customer data and information, build knowledge from that, and disseminate the resulting knowledge across the organization. As a result, these processes will help organizations to tailor their products and services, and to personalize the entire relationship with the customer based on the latter's detected needs. This leads to increased customer satisfaction and finally to economic profitability (Nejatian et al., 2011). Thus, knowledge management is deemed crucial to effective customer relationship management (Zablah et al., 2004).

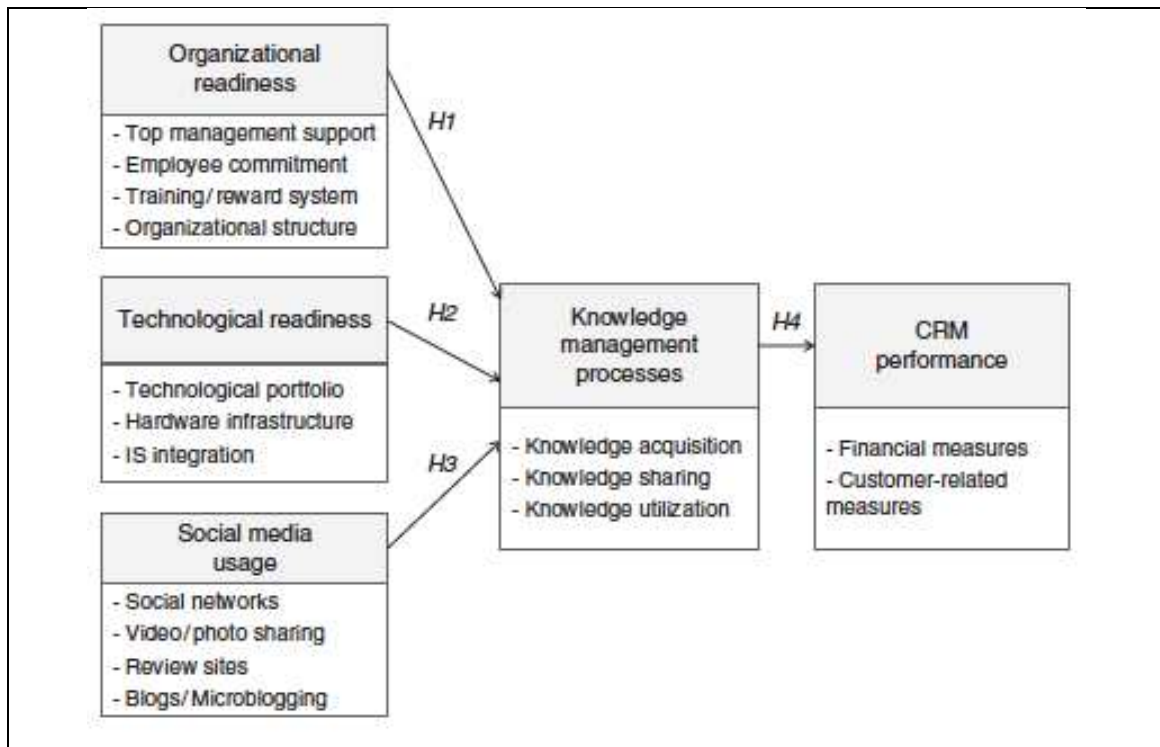
In order to properly develop a CRM innovation, companies need to know who the most profitable customers are, and how to establish their loyalty. Knowledge management processes encompass the tasks of collecting, evaluating and interpreting customer information (e.g. customers' needs, satisfaction and dissatisfaction) to identify profitable customers and be able to suggest actionable intelligence (i.e. ways to create customer value and satisfaction) that will attract new customers and retain existing ones. By analyzing the data regarding these customers' purchasing history, the company can identify current customers (and predict potential ones) towards whom it should direct its attention in order to make them more profitable and loyal. Analyzing customer knowledge, companies can even anticipate desertion by analyzing past complaints and problems (Mendoza et al., 2007). Firms with an ability to be more knowledgeable about how to serve their customers better than competitors should be able to generate better CRM organizational performance (Suntornpithug et al., 2010).

To measure CRM performance, based on previous literature (Chen and Ching, 2004; Sin et al., 2005; Chang et al., 2010; Suntornpithug et al., 2010), we have included in the empirical analysis several items that reflect, not only their impact in financial measures (such as profitability or sales), but also their effect on customer-related measures such as customer satisfaction, loyalty or retention.

Previous studies have confirmed how effective knowledge-management processes will determine CRM performance (e.g., Campbell, 2003; Croteau and Li, 2003; Nejatian et al., 2011). Campbell (2003) empirically observed the importance of harnessing knowledge-based competences when implementing CRM, because this accumulated knowledge enables firms to develop customer-specific strategies, which can become a source of competitive advantage. Croteau and Li (2003), drawing on a sample of big companies, found that knowledge management was the most significant factor affecting CRM results, which confirms that a high level of knowledge management capabilities seems to foster effective and efficient management of customer relationships. Similarly, Nejatian et al. (2011), observed a significant interaction effect between customer knowledge management and CRM performance. Thus, we propose our final hypothesis:

Hypothesis 4. Knowledge management processes will have a positive effect on the performance of a CRM innovation

The proposed research model, including the four hypotheses posed, is shown in Figure 1.



3. Research methodology

3.1 Sample description

The population for this study consisted of service firms, located in Spain, which were implementing a CRM innovation. We focus on the service sector because is a key driving force behind the Spanish economic growth. According to the Spanish Statistical Office, the private service industries account for approximately 49% of total economic activity in this country, directly generated 65% of total employment; and its impact and relevance has increased in recent years (INE, 2014). In addition, other reason for choosing this sector was that CRM is extremely important for service companies, due to their necessary close relation with customer, and the specific relevance of customer service and customer satisfaction.

Data was obtained from a public database provided by the Spanish government. Based on previous literature on the topic, and after interviewed some researchers and general managers from the service sector in order to collect their insight on the topic, a web-based questionnaire was developed. The questionnaire was sent randomly to one-half of the population, 920 companies. We followed the key-informant methodology in this work, choosing the general managers as informants, as in previous studies (Croteau and Li, 2003; Hernaus et al, 2012; Suntornpithug et al., 2010). We made several calls and sent several emails to each business with the goal of increasing the response rate. The general managers knew that the data obtained would be confidential and would be treated in aggregate form. We offered them the option of

receiving a comparative study, specific to their firm, of the variables analyzed. This enabled us to obtain 93 valid responses, which gave an approximate response rate of 10.1%.

The possibility of non-response bias was checked by comparing the characteristics of the respondents to those of the original population sample. A series of chi-square and t-statistics revealed no significant differences between the respondents and the sample, or between early and late respondents. Nor did we find significant differences based on the size of the firms (Armstrong and Overton, 1977).

Regarding the characteristics of the sample, in terms of size, the majority of companies, 68 (or 73.1 per cent) were small business, as they have less than 50 employees, while 24.7 per cent were medium and 2.2 per cent were big companies. We also ask them about their experience in implementing a CRM innovation. In this respect, 23.7 per cent of companies were using CRM for less than 1 year, 50.6 per cent between 1 and 4 years, and 25.8 per cent more than four years. Consequently, we can affirm that the companies that integrated the sample showed a certain degree of experience in implementing CRM.

3.2 Research instrument

Based on the described literature review, we built the measurement scale for the variables included in the proposed research model. First, we developed an initial list that included more than 100 items. The repeated items were eliminated, and the most used previously for measuring the constructs were selected. After this refinement process, the final scale for measuring the four variables and CRM results consists of 26 items. The numbers of items for the different variables are described as follows:

Organizational variables: eight items developed by Li (2001), Sin et al. (2005), Suntornpithug et al. (2010), and Chang et al. (2010); that addressed the following topics: top management support, employee commitment, training and reward system, and organizational structure.

Technological readiness: three items developed by Chen and Ching (2004), Croteau and Li (2003), and Sin et al. (2005), reflecting technological portfolio, hardware infrastructure and IS integration.

Social Media use: similarly to previous studies (Haro de Rosario et al., 2013), a summatory index was calculated to measure Social Media use (it ranged from 0 to 7, including the use of seven most used tools: blogs, microblogs, social networking, video-sharing, photo-sharing, review sites and instant messaging).

Knowledge management processes: six items developed by Beijerse (1999), Li (2001), Sin et al. (2005), and Lin and Lee (2005); describing knowledge acquisition, sharing and utilization.

CRM performance: eight items developed by Chen and Ching (2004), Sin et al. (2005), Chang et al. (2010), and Suntornpithug et al. (2010), including several financial and non-financial measures such as sales income, profitability, market share, and customer satisfaction, retention and loyalty.

Except for the variable *Social Media use*, that was measured using a summative index, the other four variables were based on seven-point Likert scales ranging from 1 (strongly disagree) to 7 (strongly agree). All variables were defined as reflective constructs.

3.3 Statistical methods

Data analysis was conducted with partial least squares (PLS), a structural equation modeling (SEM) technique that uses a component-based approach to estimation. The PLS technique is oriented primarily to predictive causal analysis. In contrast to software applications such as AMOS or LISREL (a SEM technique based on covariance), PLS is based on variance and employs a principal component-based estimation approach (Chin, 1998).

This technique has been widely used in the literatures on IS, operations management, and marketing (Benitez-Amado et al., 2010). In addition, several rationales support the use of PLS in this research: this technique does not require a large sample size and it is exploratory in nature, so it is applicable for early stages of theory development (Barclay et al., 1995; Chin et al., 1996). Based on all the above, we consider PLS especially appropriate to test our research model.

4. Data analysis

Data analysis was performed using the software SmartPLS 3.1.5 (Ringle et al., 2014). Following Chin (2010) recommendations, we will follow a two-step approach to conduct PLS model evaluation. The first step involves the assessment of the measurement model. This allows the relationships between the observable variables and theoretical concepts to be specified. In a second step, we will evaluate the structural model, to test the extent to which the causal relationships specified by the proposed model are consistent with the available data.

4.1 Measurement model evaluation

Regarding the measurement model, first at all, we evaluated three kinds of validity: content validity, convergent validity and discriminant validity. Content validity of the scales was ensured by using measurement items adapted from existing scales; and also by performing a pretest with 5 academic experts and a pilot test with 5 general managers.

Convergent validity was assessed by examining the Cronbach's alphas, composite reliability and average variance extracted (AVE), which passed the thresholds generally accepted in the literature with values of 0.70, 0.70 and 0.50, respectively (Fornell and Larcker, 1981). Specifically, our Cronbach's alpha values ranged from 0.938 to 0.959, our composite reliabilities from 0.951 to 0.966 and the AVEs from 0.730 to 0.897, all providing strong evidence of reliability of the used measures. In addition, the factor loadings from constructs to indicators were > 0.7 (ranging from 0.8 to 0.968), indicating that the items had considerable individual reliability. Table 1 reports the number of items, Cronbach's alpha, composite

reliability, AVE of the constructs, and item reliability of each item. Consequently, our constructs meet the tests of convergent validity in our empirical context.

Firm characteristics	Number	%
<i>Size</i>		
Small (less than 25 employees)	68	73.1
Medium (25-50 employees)	23	24.7
Large (more than 50 employees)	2	2.2
<i>CRM experience</i>		
Less than 1 year	22	23.7
Between 1 and 4 years	47	50.6
More than 4 years	24	25.8
Total	93	100.00

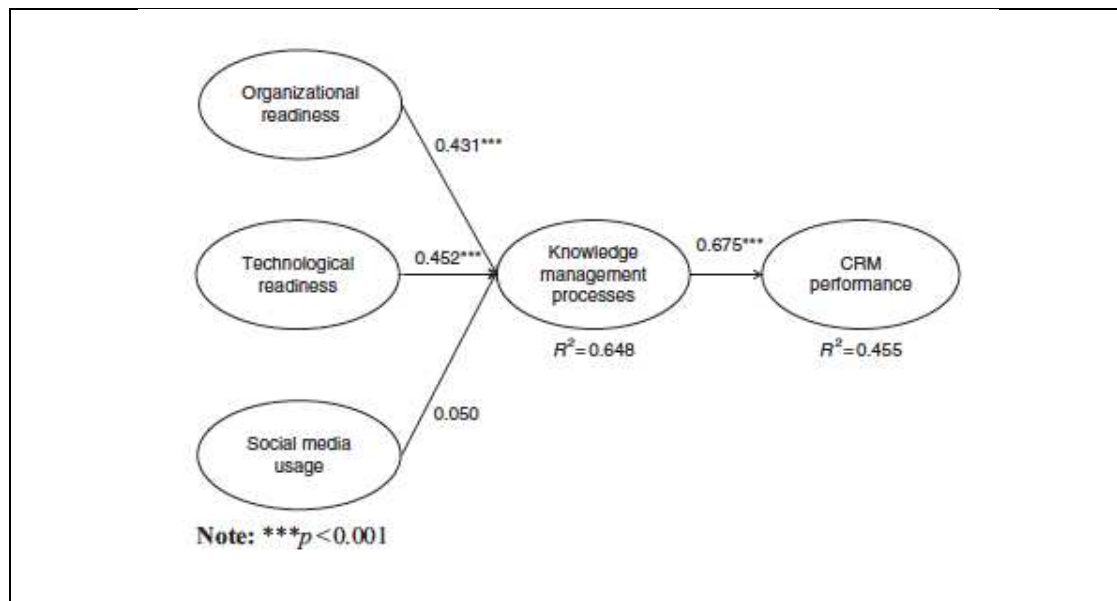
For testing discriminant validity, we compared the square root of the AVE with the correlations of each latent construct to other constructs and analyzed the correlations between the constructs and between the indicators and the constructs (Fornell and Larcker, 1981). On average, each construct related more strongly to its own measures than to others, so results demonstrate that our scales clearly show discriminant validity. Table 2 presents the correlations between the constructs and compares them to the square root of the AVE. Finally, the correlations matrix did not indicate any exceptionally correlated variables (the highest correlation among principal constructs is $r = 0.728$). Considering that evidence of common method bias usually results in very high correlations ($r > 0.90$), we can assume that common method bias was not a serious problem in our data (Pavlou and El Sawy, 2006).

Construct	Code	Items
Organizational readiness	OR1	Senior managers motivate and encourage employees to live the CRM vision
	OR2	Training programs are designed to help employees to manage customer relationships effectively
	OR3	Employee performance is measured and rewarded on the basis of their ability to effectively satisfy customer needs
	OR4	Employees are well trained in the use of CRM technologies
	OR5	Employees at all levels are committed to using CRM to achieve high levels of customer satisfaction
	OR6	Organizational structure is designed to facilitate a customer-centric approach
	OR7	The different departments work together to achieve CRM objectives
	OR8	Areas of responsibility have been reorganized to respond to customer requirements on a personal level
Technological readiness	TR1	The company has the appropriate portfolio of CRM technologies to effectively serve its customers
	TR2	The company has the appropriate hardware infrastructure to serve its customers
	TR3	The company's information systems are integrated across the different functional areas
Social media use	SM1	Blogs
	SM2	Microblogs (www.twitter.com)
	SM3	Social networking (www.facebook.com)
	SM4	Video sharing (www.youtube.com)
	SM5	Photo sharing (www.flickr.com)
	SM6	Review sites (www.tripadvisor.com)
	SM7	Instant messaging
Knowledge management processes	KM1	The company provides channels to enable ongoing two-way communication with key customers
	KM2	The company has established processes to acquire knowledge about customers
	KM3	The company fully understands the needs of its key customers thanks to its knowledge about customers
	KM4	The company encourages employees to share knowledge
	KM5	The company's organizational culture encourages the acquisition of knowledge and its sharing among employees
	KM6	The company has designed processes to facilitate knowledge transmission between the different functional areas
CRM performance	CRM1	Increased sales income
	CRM2	Improved profitability
	CRM3	Increased market share
	CRM4	Improved customer satisfaction
	CRM5	Increased customer retention
	CRM6	Improved customer loyalty
	CRM7	Improved levels of customer service
	CRM8	Personalization of products and services

4.2 Structural model evaluation

We performed a bootstrap analysis with 500 subsamples to estimate the significance of the path coefficients (Chin, 1998). We found support for all of the proposed hypotheses except for H3. We observed that organizational variables have a significant positive impact on knowledge management processes ($\beta = 0.431$, $p < 0.001$), thus supporting H1. Similarly, consistent with H2, technological readiness enables the development of knowledge management processes ($\beta = 0.452$, $p < 0.001$). However, Social Media does not have a significant positive impact on knowledge management processes (H3), although the effect is in the hypothesized direction. Finally, results confirm how knowledge management processes exert a positive

effect on CRM organizational performance ($\beta = 0.675$, $p < 0.001$). Figure 2 shows the results of hypothesis testing related to the posed research model.



In a PLS analysis, the values of the path coefficients, their level of significance, and the R^2 values are measures of how well a model is performing (Chin, 2010). One consequence of the comparison between covariance structure analysis modeling approaches and PLS is that no proper overall goodness-of-fit measures exist for models using the latter (Hulland, 1999). Consequently, the structural model was evaluated by examining the R^2 values and the size of the structural path coefficients. The path coefficients should be around 0.20 and ideally be above 0.30 to be considered meaningful and economically significant (Chin, 1998). In our analysis, the path coefficients to test the hypotheses ranged from 0.431 to 0.675 (considering only the path coefficients of the supported hypotheses), and all of them were significant at 0.01 level. The R^2 values for the two endogenous variables (knowledge management processes and CRM organizational performance) were 0.648 and 0.455 respectively. Consequently, the evaluation indicates satisfactory explanatory power for the structural model.

Finally, the Stone-Geisser test was performed for predictive relevance to assess model fit in the PLS analysis (Geisser, 1975; Stone, 1974). When q-squared is greater than zero, a model has predictive relevance. In our study, q-squared was 0.334 for the estimated model, so its predictive relevance was found to be appropriate.

5. Discussion and conclusions

5.1 Relations to previous findings and concluding remarks

Knowledge has become the most important strategic factor in business today, and companies are attempting to integrate CRM and knowledge management processes in order to better understand their

customers and build solid relationships with them. However, despite the current economic importance of CRM initiatives, in the literature there is a lack of a simple and overall framework to integrate CRM functionalities with the management and application of customer-related knowledge, in order to increase CRM performance. To shed light on this topic, an integrative model exploring the role of knowledge management processes in the development of a CRM innovation is proposed. The research model has been tested using a PLS methodology and drawing on a sample of 93 Spanish service firms. Based on the obtained results, this study makes two important contributions. (1) It highlights both organizational variables and technological readiness as the main drivers of knowledge management processes; (2) It empirically confirms that knowledge management processes exerted a significant positive impact on the performance of a CRM innovation. Each of these points is discussed in turn.

First, the study deepens our understanding of the main drivers and enablers of knowledge management processes in the context of a CRM innovation. The findings show the leading role of organizational variables and technological readiness as effective drivers of those processes. Results are consistent with prior Information Systems (IS) research that has found a positive link between organizational factors and knowledge acquisition and exchange among employees (Collins and Smith, 2006). In line with Donate and Guadamillas (2011), we have found that organizational factors, such as leadership, reward systems or training programs acted as essential elements in order to promote knowledge management processes. Regarding the role of IT, consistent with a large number of studies (Palacios-Marques et al., 2014; Chen and Chen, 2004; Croteau and Li, 2003) we confirmed how technological readiness plays a pivotal role in supporting organizational knowledge exchange processes. Similar to (Salojarvi et al., 2010) our results confirm that technological systems do enable firms to acquire, warehouse, and analyze customer information, promoting hence customer knowledge management. Our study can be considered a novel approach because it is the first to include in its analysis the impact of both drivers, while all the above mentioned studies focused exclusively on one of them.

However, regarding Social Media tools, our results do not identify them as a relevant knowledge management driver. Contrary to Trainor et al. (2014), who found that Social Media technology use had a positive association with knowledge management capabilities, we did not find a significant effect. A possible explanation for the lack of a significant relationship between Social Media use and knowledge management processes could be related to the fact that companies have only recently started to use those tools, and they need to understand what Social Media is and how it should be used. Some companies seem to have the misconception that Social Media is just another advertising channel and they fail to socialize, respond, interact, and build relationship with customers, not favoring real knowledge management processes (Chan and Guillet, 2011). In fact, in our empirical analysis, we observed that the arithmetic mean from the variable Social Media use, whose scale ranged between 0 and 7, was only 3.15. So this value indicates that the examined companies showed a low use of Social Media tools. In order to contextualize these results, we examined other studies that focused on the phenomenon of Social Media use in the Spanish context. In this vein, Eurostat (2013), considering different types of social media tools, observed that in Spain, only 31% of

companies used at least one type of Social Media in 2013. Additionally, Escobar-Rodríguez and Carvajal-Trujillo (2013) recently analyzed the topic in a subsample of service companies in Spain and confirmed that they also exhibit a low use of Social Media use and claimed not have fully incorporated all the possible elements of Web 2.0 in their strategy. Consequently, the preliminary stage of development and the low use of Social Media tools in Spanish companies can be an alternative explanation of the lack of a significant link between Social Media use and knowledge management processes.

A second contribution of this study is to highlight the substantial effect of knowledge management processes on CRM organizational performance. Considering that a firm's capability to create and utilize knowledge has become the most important source of its sustainable competitive advantage (Grant, 1996); we have confirmed that knowledge management plays a critical role when implementing a CRM innovation. Consistent with prior IS research, our findings have confirmed the direct influence of knowledge management processes on the success of CRM initiative (Croteau and Li, 2003; Love et al., 2009; Sin et al., 2005). Since knowledge management is responsible for acquiring and accumulating knowledge within organizations to promote innovation and CRM is able to capture customer preferences, desires and above all, accumulate knowledge; the integration of these two concepts could provide significant benefits to organizations (Nejatian et al., 2011). Consequently, these findings are also valuable for academics who study the business value of IT-related innovations.

This paper provides a very useful source for academics and managers since it investigates connections between drivers of knowledge management, knowledge management processes and CRM performance. Results are particularly interesting because they show the specific sequence that companies need to follow in order to implement successfully knowledge management and CRM initiatives, taking advantage of their synergy potential. The study covers a gap previously detected in the literature, providing empirical evidence on the topic, based on a confirmatory methodology. In addition, this research is the first empirical study examining Social Media use and knowledge management in a Spanish context. The proposed conceptualization and measurement of Social Media is a first attempt to identify this novel phenomenon. However, IS academics can build on the present work developing more precise measures of Social Media use and impact, and examining it in different contexts. Considering that research into Social Media is still at an embryonic stage (Michaelidou et al., 2011), it would be interesting to better conceptualize and measure Social Media use, developing more sophisticated measures that include frequency of use, relevance of the different tools implemented and strategic integration with the global customer strategy.

5.2 Research limitations and future research lines

The study does have several limitations, many of which highlight potential opportunities for future research. First, the study uses data provided by only one key informant per firm (the general manager), which could involve a degree of subjectivity. It would be interesting to develop future studies including the perspective of other agents involved in developing CRM: managers, employees, and customers. Second, this research is cross-sectional, which prevents us from examining the evolution over time of the phenomenon

under investigation. This is especially interesting in light of the dynamic nature of some of the variables presented. To explore this issue, future research should include longitudinal data to better explain the observed relationships and their temporal evolution. Third, the empirical study has focused specifically on the Spanish services sector, so the results obtained here may not be entirely generalizable to other sectors of activity or other countries. Consequently, studies at the international level would be useful in order to test the validity of the model using data from other countries.

5.3 Implications

The research findings have important implications for both IT and business managers. Considering the high rate of failure observed when implementing a CRM innovation, the study both theoretically and empirically, reveals how firms can achieve organizational benefits by combining CRM with knowledge management processes. Results confirms that developing appropriate knowledge management processes are a prerequisite to be successful with CRM, both in terms of financial success (profitability, sales, market share) as well as in terms of customer satisfaction, retention and loyalty. The study's results confirm also that organizational variables and technological readiness acted as relevant enablers of knowledge management processes. Consequently, managers need to invest in a suitable CRM technological infrastructure, including software, hardware and analytical capabilities, which allow them to capture relevant customer information, and build knowledge from these data. In addition, information systems have to be integrated across all the different functional areas, in order to share this generated knowledge and be able to quickly respond to customer needs, drawing on this knowledge. Moreover, organizational climate has also proved to be determinant. Managers should promote an organizational culture encouraging employees to acquire, share and use knowledge effectively. They should develop a supportive leadership and introduce new reward and incentive programs consistent with the CRM objectives, motivating employees to engage in the necessary organizational change. In summary, the results suggest that, to implement a CRM innovation successfully, managers need to pay special attention to both technological and organizational variables, because they are effective enablers of knowledge management processes (including knowledge acquisition, sharing and utilization), which, in turn will make a determinant impact in CRM organizational results.

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Appendix: Questionnaire used in the empirical study

1. SOCIAL MEDIA USE

Which of the following new social media tools are used by your company for communicating and building relationships with customers?

- Blogs
- Microblogs (www.twitter.com)
- Social networking (www.facebook.com)
- Video sharing (www.youtube.com)
- Photo sharing (www.flickr.com)
- Review sites (www.tripadvisor.com)
- Instant messaging

Please, indicate your level of agreement with the following statements, regarding the company you manage. (1 = strongly disagree, 2 = quite disagree, 3 = partly disagree, 4 = neutral, 5 = partly agree, 6 = quite agree, 7 = strongly agree).

2. ORGANIZATIONAL VARIABLES

- Senior managers motivate and encourage employees to live the CRM vision.
- Training programs are designed to help employees to develop the skills needed to manage customer relationships effectively.
- Employee performance is measured and rewarded on the basis of their ability to effectively satisfy customer needs.
- Our employees are well trained in the use of CRM technologies.
- Employees at all levels are committed to using CRM to achieve high levels of customer satisfaction.
- Organizational structure is designed to facilitate a customer-centric approach.
- The different departments work together to achieve CRM objectives.
- We have reorganised areas of responsibility in order to ensure that our employees can respond to customer requirements on a personal level.

3. KNOWLEDGE MANAGEMENT PROCESSES

- My company provides channels to enable ongoing two-way communication with key customers.

- My company has established processes to acquire knowledge about customers.
- My company fully understands the needs of its key customers thanks to its knowledge about customers.
- My company encourages employees to share knowledge.
- My company's organizational culture encourages the acquisition of knowledge and its sharing amongst employees.
- My company has designed processes to facilitate knowledge transmission between the different functional areas.

4. TECHNOLOGICAL READINESS

- My company has the appropriate portfolio of CRM technologies to effectively serve its customers.
- My company has the appropriate hardware infrastructure to serve its customers.
- My company's information systems are integrated across all the different functional areas.

5. CRM PERFORMANCE

The implementation of a CRM innovation in our company has:

- Increased sales income
- Improved profitability
- Increased market share.
- Improved customer satisfaction.
- Increased customer retention.
- Improved customer loyalty.
- Improved levels of customer service.
- Enabled the personalisation of products and services