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Customer Knowledge Management in SMEs Facing Digital Transformation

Francesco Castagna [1], Piera Centobelli [1], Roberto Cerchione [2,*], Emilio Esposito [1], Eugenio Oropallo [1] and Renato Passaro [2]

[1] Department of Industrial Engineering, University of Naples Federico II, P.le Tecchio 80, 80125 Naples, Italy; francesco.castagna@unina.it (F.C.); piera.centobelli@unina.it (P.C.); emilio.esposito@unina.it (E.E.); eugenio.oropallo@unina.it (E.O.)

[2] Department of Engineering, University of Naples Parthenope, Centro Direzionale di Napoli, Isola C4, 80143 Naples, Italy; renato.passaro@uniparthenope.it

* Correspondence: roberto.cerchione@uniparthenope.it

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Abstract: This paper provided a novel definition of customer knowledge management (CKM) as the logical intersection of customer relationship management (CRM) and knowledge management (KM). The main aim was to investigate the digital technologies supporting small and medium enterprises (SMEs) operating in creative industries in their customer knowledge management strategies. To achieve this aim, a survey involving 73 handicraft and/or retail SMEs operating in luxury jewelry industry was conducted. The survey results pointed out that in a few years the scenario has changed and that surveyed SMEs make more intensive use of traditional technologies supporting customer knowledge management processes rather than more innovative digital technologies, which are also cheap and easy to use. This finding showed the difficulties of SMEs operating in creative industries to be responsive to the rapid technological changes that are affecting CKM, as well as the lack of support from information technology vendors in the decision-making process for choosing adequate digital systems.

Keywords: creative industry; customer knowledge management (CKM); customer knowledge management systems (CKMSs); customer relationship management (CRM); digitalization; digital technologies; small business; survey

1. Introduction

Recent research contributions revealed that enterprises are adopting digital technologies to improve their knowledge management processes that in turn have an impact on innovation, the market and financial performance [1–3]. The digital revolution has questioned the extant innovation and organisational learning theories [4]. For instance, Nambisan et al. (2017) [5] analysed how organisational axioms may be changed by the rise of digitalisation to renew a knowledge base and improve innovation performance. This evolving technological and organisational environment has required firms to improve their knowledge management (KM) processes (e.g., acquisition, storage, transfer) since a focus on internal knowledge or an exposure to external knowledge are not sufficient to increase innovativeness [6–10].

Meanwhile, information systems scholars found evidence that digitalization has a pivotal role for enabling external knowledge acquisition activities [11]. Nowadays firms therefore are focusing their efforts to digitalise their innovation processes [5], especially for KM objectives. In fact, the established organisational routines and processes affecting KM strategies are likely changing together with the direction being identified by the adoption of digital solutions for product and process innovation

(e.g., advanced business analytics, digital platforms, machine learning). For instance, the processes of knowledge acquisition, storage and transfer are changing in terms of the amount of data and information to be managed due to the emergence of appropriate digital infrastructures. Similarly, firms adopting digital solutions have to acquire and transform different types of external knowledge compared to non-digital firms, thus requiring the opportunity to use new knowledge management systems (KMSs) [12]. This means that digital innovation has created a new fluidity in innovation processes, however it is also asking firms to rethink the ways they can explore and exploit knowledge flows, and the way they can leverage on the adoption of digital platforms, infrastructures and artefacts [13–16].

In recent years creative industries have acquired a relevant role in European countries where small and medium enterprises (SMEs) represent a vast majority of all companies [17,18]. As for the epistemological perspective, the knowledge created in firms operating in creative industries is mainly tacit in nature [19]. As for the ontological perspective, in the context of SMEs operating in creative industries, customer knowledge is mainly embodied in organizational members and embedded in specific practices, know-hows and routines [20]. Despite the fact that previous authors have shown growing interest in investigating knowledge management processes in the context of creative industries, there is a lack of empirical papers aimed to investigate customer knowledge management issues [21,22].

Customer knowledge management is somewhat unique in the field of knowledge management [23]. Customer knowledge management integrates the set of organisational practices and dynamic skills related to the creation, storage and transfer of knowledge about the customer [24] to gain a sustainable competitive advantage in the market [25] and improve business efficiency through specific development strategies [26]. Nevertheless, although knowledge management has been studied in different fields and customer knowledge management has been investigated as an antecedent of sustainable and competitive success, further research is needed to analyse the role of customer knowledge management in the creative industry domain [27,28]. In this industry, managing customer knowledge through collaborative innovation paths has a critical role in achieving successful innovation practices [24]. Furthermore, Prahalad and Ramaswamy (2004) investigated the role of customer collaboration and enabling technologies to allow successful organisations to learn from their customers' needs, how to meet their demands and thus improve performance [29]. In this context, despite previous contributions focusing on specific relational tools, marketing tools and search optimisation tools, there is a clear need for a comprehensive overview of the digital technologies used by SMEs to support their customer knowledge management strategies. Within this evolving scenario, technology dynamics and digital transformation are increasingly offering to firms, in particular to SMEs, new digital technologies that are low cost, ease-to-use and effective [30–34].

With these premises, the main aim of this paper was to investigate the digital technologies supporting SMEs operating in creative industries in their customer knowledge management strategies. To achieve this aim, it is necessary to distinguish between different categories of technologies, namely relational tools, marketing tools and search optimisation tools.

The article is structured in six sections: the introduction (Section 1), the framework (Section 2), unit of analysis (Section 3), methodology (Section 4), presentation of findings (Section 5) and the conclusions and implications (Section 6).

2. Framework

Customer knowledge management represents a research area at the intersection between knowledge management and customer relationship management [35,36].

The main objective of the literature search was to analyse the state-of-the-art on customer knowledge management before to moving to the digital technologies supporting customer knowledge management (CKM) strategies in order to identify potential gaps [37–39].

Customer knowledge management integrates the set of organisational practices and dynamic skills related to creating, conserving and transferring knowledge about the customer [24]. Previous research

highlights that customer knowledge management strategies pertain primarily to the socialization processes with customers that have a critical role in gaining a competitive advantage in the market [25,40]. Similarly, Srikantaiah et al. (2000) investigated how managing customer knowledge is crucial to achieve a better and more timely design of new products and services, competitive intelligence, customer commitment and loyalty, as well as a synergy of collaboration [41]. On the contrary, Butler (2000) highlighted the lack of attention paid to customer knowledge stating that customers know more about the organizations they do business with than the business knows about its customers [42]. Even though all businesses recognize that they are nothing without their customers, they rarely fully capitalize on the customer knowledge that their employees informally collect, avoiding a deep customer relationship which is one of the business strategies that organizations must adopt for competitive gains. Customer relationship focuses on obtaining information on customer's needs in order to improve customer satisfaction and increase its buying behaviour; once this customer relationship is achieved, the customer will avoid the high costs of switching to other businesses [40]. Davenport et al. (2001) focused on three main elements of customer knowledge: (1) company efforts to capture customer knowledge, (2) marketing activities, and (3) customer relationship management (CRM) [43]. In more detail the authors presented a comprehensive review of the efforts that an organization made to capture customers' knowledge focusing on the value of personal interactions. However, there is again a lacuna about the methods and tools to obtain this kind of knowledge. An important step was reached by Gibbert (2002) that identified five different styles of customer knowledge management depending on different sectors [44]: (1) prosumer (Toffler, 1980), where the customer could fill the dual roles of producer and consumer (e.g., Quicken; IKEA) [45]; knowledge in this case is more explicit. (2) Team-based co-learning (Gibbert, 2002), where inter-linkages are established with the customer base and standing by their interactive joints, the organization becomes attractive for many other companies for its learning performance standing by its own customer interactions (e.g., Amazon.com; Xerox, Holcim, Mettler, Toledo) [44]; knowledge in this case is both explicit and tacit. (3) Mutual innovation (Thomke and Hippel, 2002), where innovations come not from within the organization but from end-users (e.g., Silicon Graphics, Ryder) [46]; knowledge in this case is more tacit. (4) Communities of creation (Sawhney and Prandelli, 2000), where innovations come from end-users but in contrast to mutual innovation, it is not possible to collect end-user ideas and each customer has to interact with the others and the organization has to elaborate together the innovation knowledge (e.g., Microsoft; Sony; eBay, Holcim) [47].; in this case the knowledge is also more tacit. (5) Joint intellectual property (Gibbert, 2002) where as in mutual innovation, the organization has to collaborate with customers even though intellectual property does not reside in the organization but is 'owned' partly by the customers (e.g., Skandia assurance) [44]; knowledge in this case is more explicit.

Each type of customer knowledge has specific characteristics and requires specific tools to be achieved. At this point, it results as important to highlight the point of view of Rowley (2002) that formalized how recent technological tools facilitate the knowledge transfer, acquisition and elaboration [48]. Customer data can be collected as customer feedback, during transactions and through cookies and web-server logs. At this point there is no shortage of data in e-business, but it is necessary to clear and elaborate these data to achieve the right knowledge [48].

Managing customer knowledge through collaborative innovation paths has a critical role in achieving successful innovation practices [24]. Furthermore, Prahalad and Ramaswamy (2004) investigated the role of customer collaboration and enabling technologies to allow successful organisations to learn from their customers' needs, how to meet their demands and thus improve performance [29]. Despite that there are previous studies that address customer knowledge management with regards to its implications for business and projects [49–53], the necessity emerges of conducting further research in the creative industry domain [54]. In fact, although previous studies have investigated the specific benefits of applying customer knowledge management in the creative industry domain, these contributions do not investigate the specific technical and technological capabilities supporting firms to achieve these benefits [55]. In more detail, previous research suggested that in SMEs

belonging to creative industries the processes of the acquisition, storage and transfer of knowledge should leverage on knowledge nature that is mainly human-embodied through experience and extends to more institutionally-embodied knowledge where the organization's members develop capabilities through the integration of technological tools and organizational approaches [56,57]. In this context, digital technologies can support SMEs operating in creative industries to manage customer knowledge.

Moving to the technology-based customer knowledge management domain (Table 1), where relational tools are communication (e.g., email, blog, content management system) and the collaborative tools (e.g., social media) used to share knowledge and manage the relationships with customers that represent an active part in the communication process [58–60]. Zahay and Handfield (2004) analysed the use of a "shoppable Internet catalogue" developed with the customer [61]. Hsu et al. (2013) illustrated how the adoption of e-voting tools improves companies brand image and also increases customer satisfaction [62]. Syuhada and Gambett (2013) and Govender (2013) analysed the impact of social media on marketing strategies for micro-firms, whereas Pentina and Koh (2012), Durkin et al. (2013), Öztamur and Karakadılar (2014) and Nobre and Silva (2014) focused on small and medium ones [63–68]. Recent studies stated that the conversations among social media users have a great impact on their evaluation and demand [69]. Tussyadiah and Fesenmaier (2008), Cobe (2008) and Chen and Lin (2015) demonstrated the substantial potential of blogs for marketing strategies [70–72]. Yu et al. (2008), Ngu et al. (2010) and Patel et al. (2015) provided an overview of current trends of mash-up adoption [73–75].

Table 1. Papers dealing with the digital technologies supporting customer knowledge management strategies.

Digital Technologies	References
Relational Tools	Al-Mutawah et al. (2009); Chen and Lin (2015); Choundary (2013); Cobe (2008); Dotsika and Patrick (2013); Douligeris and Tilipakis (2006); Durkin et al. (2013); Edvardsson (2009); Goel et al. (2005); Govender, 2013; Grace (2009); Gresty (2013); Hsu et al. (2013); Huang and Lin (2010); Liu and Lopez (2014); Lopez-Nicolas and Soto-Acosta (2010); Malhotra et al. (2007); Ngu et al. (2010); Nobre and Silva (2014); Öztamur and Karakadılar (2014); Patel et al. (2015); Pentina and Koh (2012); Razmerita and Kirchner (2011); Rosu et al. (2009); Shih et al. (2012); Syuhada and Gambett (2013); Tussyadiah and Fesenmaier (2008); Wu (2001); Yu et al. (2008); Zahay and Handfield (2004)
Marketing Tools	An and Stern (2011); Blois (1999); Briggs and Hollis (1997); Cheung (2008); Drèze and Hussherr (2003); Duffy (2005); Emiliani (2000); Gosselin and Poitras (2008); Gross (2011); Hoffman and Novak (2000); Huang et al. (2009); Johnston (1999); Kim and Lee (2015); Lohtia et al. (2003); Mallinckrodt and Mizerski (2007); Manchanda et al. (2006); Mariussen et al. (2010); Patterson (1997)
Search Optimisation Tools	Dou et al. (2010); Ghose and Yang (2009); Goldfarb and Tucker (2011); Murphy and Kielgast (2008); Nasomyont and Wisitpongphan (2014); O'Neill and Curran (2011); Sen (2005); Shih et al. (2013); Yang and Ghose (2010)

Marketing tools are banner advertising, mobile advertising and direct email marketing used in CKM to share knowledge and manage the passive role of customers that are subjected to communication processes [76–78]. Briggs and Hollis (1997), Drèze and Hussherr (2003), Lohtia et al. (2003) and Manchanda et al. (2006) analysed the use of banner advertising [76–79]. Kim and Lin (2015) focused on mobile advertising in terms of the impact maximisation through targeted marketing based on the customer needs [80]. Gosselin and Poitras (2008), Cheung (2008) and Huang et al. (2009) described direct the adoption of email marketing whereas Hoffman and Novak (2000), Duffy (2005) and Mariussen et al. (2010) focused their attention on affiliate marketing [81–86]. Mallinckrodt and Mizerski (2007), Gross (2010) and An and Stern (2011) investigated the impact of advergames on

children-oriented marketing [87–89]. Patterson (1997), Blois (1999), Johnston (1999) and Emiliani (2000) investigated the influence of both business-to-business (B2B) and business-to-customer (B2C) on customer satisfaction [90–93].

Search optimisation tools represent the set of sponsoring activities made by a third service organization that focus their attention on a correlation between search engine optimisation (SEO) or search engine marketing (SEM) tools and the rank in search engine result pages (e.g., Google, Bing, Yahoo!) [94–103]. O'Neill and Curran (2011), Shih et al. (2013) and Nasomyont and Wisitpongphan (2014) focused their attention on search engine optimisation (SEO) [94–96], whereas Sen (2005), Murphy and Kielgast (2008) and Dou et al. (2010) analysed the use of search engine marketing (SEM) tools [97–99]. Ghose and Yang (2009), Yang and Ghose (2010) and Goldfarb and Tucker (2011) [100–102] showed the opportunity offered by search engine advertising as a tool to advertise websites in search engines.

In summary, previous contributions have focused on specific relational tools (29), marketing tools (18) and search optimisation tools (9), but did not offer a comprehensive overview of their adoption by SMEs. There is a therefore a clear need for a deeper analysis of the digital technologies used by SMEs in the field of customer knowledge management. The above literature gap allows us to formulate the following research question (RQ):

RQ: What are the main digital technologies supporting SMEs operating in creative industries in their customer knowledge management strategies?

In order to provide an answer to the above research question, the following section provides an overview of the unit of analysis in which the survey was conducted.

3. The Unit of Analysis

The analysis was conducted in a sample of 73 firms operating in Campania (Southern Italy). The sampling strategy adopted was the judgment sampling, a non-probability-based sampling method. According to Malhotra, Birks and Wills (2013), in non-probability judgmental sampling, the authors choose the sample group based on their judgments and preferences in order to address the purpose of the study. Considering the specific sector analysed, we employed this sampling technique since a limited number of enterprises operated in the context of investigation.

Regarding data collection, the survey was conducted in a web-based mode. The final sample comprised micro, small and medium firms (European Commission, 2005. The New SME Definition. User Guide and Model Declaration. DG Enterprise & Industry, Bruxelles) operating in luxury jewellery handicraft and/or retail, as well as 17 firms operating in other industries out of the scope of research (food, security, tourism, etc.). The total employment was about 2000 people and the total turnover was around 300,000 Euros in 2016.

Table 2 shows that most of the firms belonging to the sample operated in the retail industry (46 firms); 19 firms operated in both the handicraft and the retail industries; finally, there were eight handicraft firms that were not retailers.

Table 2. Firm industries.

Overall Economic Industry	Number of Firms	%
Handicraft	8	10.96
Retail	46	63.01
Handicraft/Retail	19	26.03
Total	**73**	**100**

4. Methodology

The spread of world wide web significantly increased the number of easily accessible documents and information related to companies. In this context, the potential of document analysis, which aims at extracting symbolic and structured information from online sources, represents a novel and attractive methodology of investigation. In this paper, a two-phase methodology to conduct a field

analysis involving SMEs operating in creative industries was adopted (Appendix A). These phases are summarised below:

- Data search and collection. In this phase, company websites and other relevant sources were identified and analysed to collect information about the adoption of digital technologies supporting customer knowledge management strategies. All the relevant data were collected in a shared database and cross-checked by all the researchers [103,104].
- Confirmatory analysis. In this phase, the information collected in the previous step was confirmed and/or supplemented by interviews to ensure the reliability of the results [105,106].

The methodology was conducted through the following five steps:

I. *Defining survey objectives*, in which the basic aims were identified;
II. *Defining the draft list of digital technologies supporting customer knowledge management*, in which a first list was prepared using the tools identified in the body of literature;
III. *Establishing focus group*, in which KM experts with different competences were involved to define the list of tools;
IV. *Testing the survey on the unit of analysis*, in which was conducted a pilot field analysis of five SMEs to integrate the final list;
V. *Implementing survey*, in which was conducted a comprehensive analysis of the SMEs' webpages and information from phone calls and/or complementary sources were collected and analysed.

5. Presentation of Findings

This section reports the set of digital technologies emerging from the literature review findings on the topic of customer knowledge management and adapted to the unit of analysis. Specifically, a draft list of tools was obtained by adapting those proposed in the literature (see II step of methodology). Afterwards, this draft list was submitted to a number of KM experts (see III step of methodology). The feedbacks received and the pilot test of the survey were used to develop a final list (see IV step of methodology). The digital technologies included in the final list were divided into relational tools, marketing tools and search optimisation tools.

The percentage of use of each digital technology supporting the surveyed firms in their customer knowledge management strategies was evaluated. With regard to the relational tools, Figure 1 highlights that their percentage of use ranged from 1.75% (audio conference/video conference and e-voting) to 76.96% (e-mail), with a mean equal to 24.74%. The high value of the variance indicated that the intensity of use of relational tools by the selected firms were very spread out around the mean and from each other.

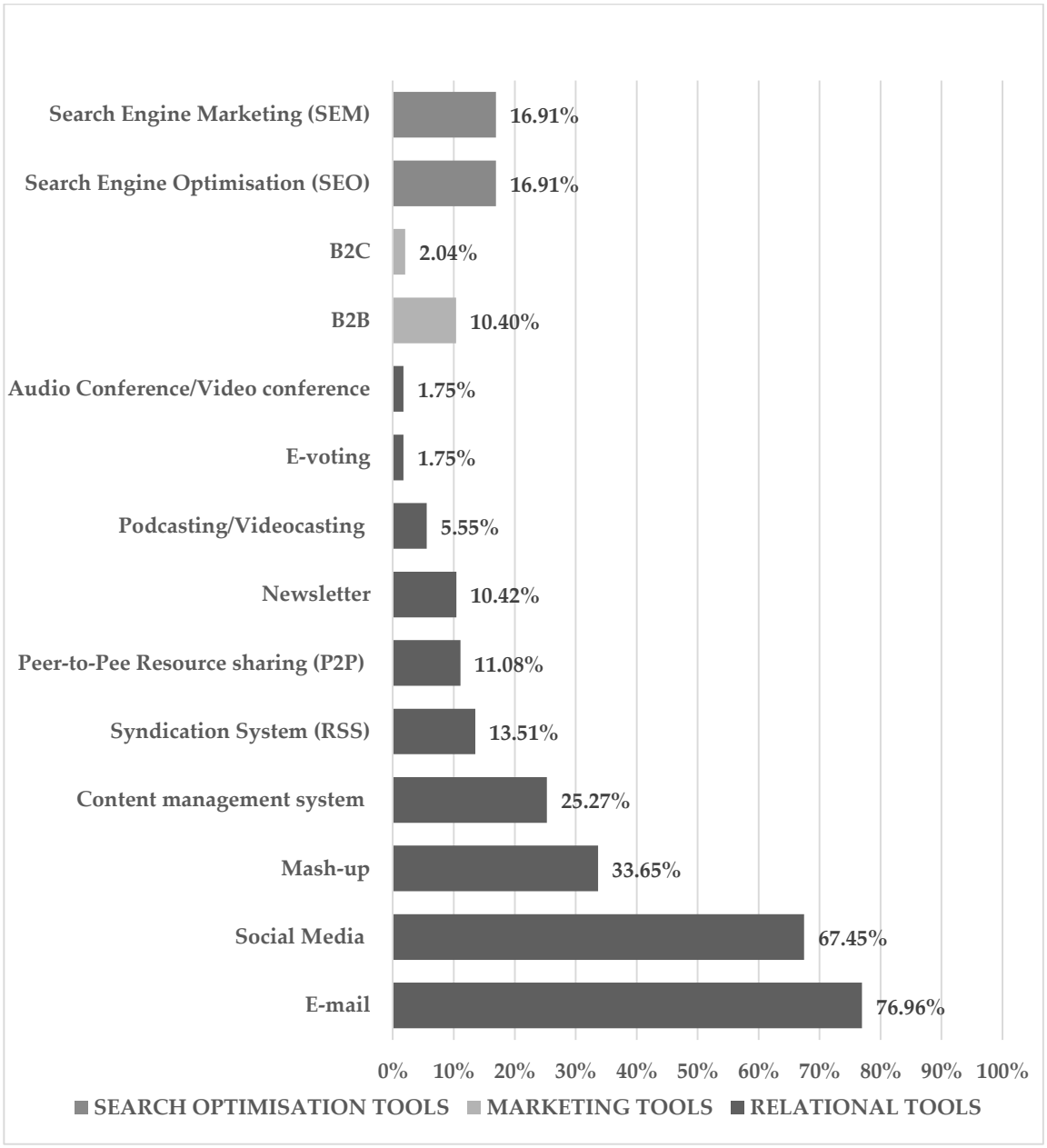

Figura 1. Porcentaje de adopción de tecnologías digitales que apoyan a las pequeñas y medianas empresas (PYMES) en la gestión del conocimiento del cliente.

Un primer grupo de herramientas relacionales adoptadas con un porcentaje superior al 50% incluyó el correo electrónico (76.96%) y las redes sociales (67.45%). Como dos de las herramientas más extendidas y populares, representaron una forma rápida para que los clientes contactaran con las empresas y realizaran preguntas. Además, estas dos herramientas no requerían habilidades avanzadas para los usuarios y tenían un tiempo y costo de adopción casi nulos.

La Tabla 3 resalta cómo las diferentes herramientas fueron utilizadas por las PYMES pertenecientes a distintos sectores. Los sectores de artesanía y artesanía al por menor tendían a adoptar el correo electrónico (87.50% y 84.21%, respectivamente) en lugar de las redes sociales (62.50% y 68.42%), mientras que, por el contrario, los minoristas mostraron un uso más intenso de las redes sociales (71.43%) que del correo electrónico (59.18%).

Un segundo grupo de herramientas relacionales con un porcentaje de adopción entre el 10% y el 40% incluyó mash-up (33.65%), sistemas de gestión de contenidos (25.27%), sistemas de sindicación (13.51%), intercambio de recursos entre pares (11.08%) y boletines (10.42%). Excluyendo boletines e intercambio de recursos entre pares, estas últimas son herramientas cuya adopción requiere habilidades más avanzadas. Este grupo de herramientas ha...

the same distribution among the three different sectors except for newsletters that are not used by handicraft. A third group of relational tools adopted with a percentage lower than 10% included podcasting/videocasting (5.55%), audio conference/video conference (1.75%) and e-voting (1.75%). Although the above tools have a very low cost of adoption and require basic skills, they were scarcely adopted by the surveyed SMEs. Focusing on the specific sectors, the results showed that only handicraft and retailer SMEs adopted these tools, even though the percentage was low (5.26%).

As for marketing tools, business-to-business (B2B) were used with a percentage of 10.40% followed by the business-to-customer (B2C) with 2.04%. Specifically, the marketing tools used by the surveyed SMEs were the online marketplace, which allows firms to create profiles and sell products to customers or to other firms (respectively B2C or B2B). Product information is provided by the firm, but transactions are processed by the marketplace. The majority of surveyed SMEs adopted eBay, which is one of the most adopted marketplaces in Italy.

Table 4 highlights how the B2B solution was equally distributed among retailer, handicraft and handicraft and retailer, even though B2C solutions were used exclusively by retailer enterprises.

Concerning search optimisation tools, search engine optimisation (SEO) and search engine marketing (SEM) were adopted by 16.91% of surveyed SMEs.

Table 5 highlights how SEO tools and SEM tools were preferred in customer-oriented firms as retailer and handicraft and retailer (with 22.45% and 15.79%).

In summary, as for relational tools, this paper highlighted that the majority of investigated firms adopted only one digital technology to support customer knowledge management strategies. Regarding marketing tools, these findings seemed to point out that the surveyed SMEs scarcely adopted the few digital technologies represented by marketplaces, but all the firms neglected other tools identified in the literature, such as direct email marketing, banner advertising, affiliate marketing and advergames.

Finally, concerning search optimisation tools, the selected SMEs tended to adopt search engine optimisation (SEO) and search engine marketing (SEM).

These results showed that the investigated SMEs made more intensive use of traditional digital technologies supporting customer knowledge management processes, rather than more innovative digital technologies, despite the latter being generally cheaper, more user-friendly and more effective [30,32–34]. Furthermore, the differences between the handicraft and the retailer sectors were linked with the nature of the sectors. Companies belonging to handicraft sectors were on average more inclined to adopt more formal digital tools (e.g., the e-mail), whereas retailers tended to adopt more informal tools (e.g., the social media) considering that customer knowledge from tacit sources is becoming an important organizational asset [57]. The results highlighted that customer knowledge in handicraft companies was more explicit in nature and embedded in specific know-hows and routines. On the contrary, customer knowledge managed by retail companies tended to be more tacit in nature and mainly embodied in organisational members. Companies belonging to the handicraft and retailer sector were in the middle of these two behaviours, but they were on average more inclined to adopt formalised tools showing a more explicit customer knowledge identity.

The proposed results were in line with the previous study by Centobelli et al. (2019) [12], in which it was assumed that the relational tools, marketing tools and search optimisation tools supported firms to manage knowledge in the different processes of knowledge creation, storage and transfer. For instance, as for the relational tools, mash-up and syndication systems can support firms in customer knowledge creation processes, content management system can support customer knowledge storage, whereas other digital technologies (e.g., e-mail, social media, peer-to-peer resource sharing, podcasting/videocasting, audio conference/video conference) can support customer knowledge transfer.

Table 3. Percentage of adoption of the relational tools by firm sector.

	E-Mail	Social Media	Mash-Up	Content Management System	Syndication System (RSS)	Peer-to-Peer Resource Sharing (P2P)	Newsletter	Podcasting Videocasting	E-Voting	Audio Conference Video Conference	Relational Tools
Retailer	59.18%	71.43%	28.57%	24.49%	12.24%	10.20%	10.20%	6.12%	0.00%	0.00%	**22.24%**
Handicraft	87.50%	62.50%	25.00%	25.00%	12.50%	12.50%	0.00%	0.00%	0.00%	0.00%	**22.50%**
Handicraft and Retailer	84.21%	68.42%	47.37%	26.32%	15.79%	10.53%	21.05%	10.53%	5.26%	5.26%	**29.47%**

Table 4. Percentage of adoption of the marketing tools by firm sector.

	B2B	B2C	Marketing Tools
Retailer	8.16%	6.12%	**7.14%**
Handicraft	12.50%	0.00%	**6.25%**
Handicraft and Retailer	10.53%	0.00%	**5.26%**

Table 5. Percentage of adoption of the search optimisation tools by firm sector.

	Search Engine Optimisation (SEO)	Search Engine Marketing (SEM)	Search Optimisation Tools
Retailer	22.45%	22.45%	**22.45%**
Handicraft	12.50%	12.50%	**12.50%**
Handicraft and Retailer	15.79%	15.79%	**15.79%**

6. Conclusions and Implications

The main aim of this paper was to investigate the digital technologies supporting SMEs operating in creative industries in their customer knowledge management strategies. According to the body of literature on the topic, the main digital technologies adopted in the customer knowledge management domain were divided into three groups: (1) relational tools, (2) marketing tools and (3) search optimisation tools. As for the relational tools, it emerged that firms generally used traditional digital technologies. This aspect was a managerial implication for information technology vendors to capture the attractiveness of the increasing market represented by SMEs. On the other hand, it was a policy implication to support SMEs, which need financial incentives for their technological and digital innovation. Concerning the marketing tools, this paper highlighted that the surveyed SMEs leveraged on marketplaces. Nevertheless, it also emerged that in this case SMEs tended to not adopt more updated tools (e.g., direct email marketing, banner advertising, affiliate marketing, advergames). Regarding the search optimisation tools, the paper seemed to point out that a major percentage of the investigated SMEs tended to adopt SEO and SEM.

This paper highlighted that the surveyed SMEs adopted and made more intensive use of traditional technologies supporting customer knowledge management processes rather than more innovative digital technologies, despite the latter being generally cheaper, more user-friendly and more effective. This result was in line with the previous studies by Centobelli et al. (2016) [31], in which it was assumed that SMEs typically did not have dedicated resources to monitor the evolution of the digital market and were not even able to follow technological dynamics, and these aspects forced them to remain in a backward position. Furthermore, the results were in line with the previous literature on KM in SMEs showing that small and medium enterprises were not simply a scaled-down replica of large firms and behaved like entities without a strategy of their own for addressing the processes of customer knowledge management [20,31,107–110].

As for the main theoretical implications, this research paved the way for further and in-depth analysis concerning the recent technological and managerial evolution of knowledge management systems [12,111,112]. In fact, KMSs are becoming a combination of knowledge management tools, namely specific IT-based systems supporting knowledge management processes, and knowledge management practices, which are defined as methods and techniques to support the organisational processes of knowledge management. Therefore, according to the previous results proposed by Carayannis (1999) and Centobelli et al. (2019) [12,113], in which it was assumed that KM played a crucial role in fostering a synergistic symbiosis between technological capabilities and managerial/organizational practices, the necessity emerged of analysing the degree of alignment between the tools and practices supporting CKM processes.

As for the practical implications, the differences between SMEs and large companies, in terms of size, structure and processes, lead them to be completely different in knowledge management processes and also in the way customer knowledge is managed. However, in many industries, SMEs represent a significant percentage of companies. Therefore, to catch this opportunity, it is necessary to strengthen the link between KMS providers and companies with direct channels and create new market segments dedicated to SMEs to offer them digital solutions tailored to their businesses.

As for the future directions, future research can conduct secondary document analysis to investigate the degree of adoption of the digital technologies investigated in this paper in order to extend and enhance the generalisation of these findings.

Limitations

This research was based on the empirical analysis of SMEs operating in creative industries that had the scope to be tested in different contexts. Therefore, future research needs to extend these results.

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Appendix A

Managing Customer Knowledge

This survey aims to collect information about the adoption of digital technologies supporting customer knowledge management strategies in creative industries. The questionnaire consists of two main sections. Section 1 includes general information about the company. Section 2 includes a list of tools for which it is asked to tick a box to specify if it was used or not.

1. General information about the company

Name of company:
Address:
Main industry:
Number of employees:

2. Digital technologies supporting customer knowledge management strategies (Relational Tools, Marketing Tools and Search Optimisation Tools)

Tick the box if the company uses one or more of the following tools (multiple choice is allowed)

Relational Tools	**Yes**	**No**
	1	*0*
Social Media	☐	☐
E-mail	☐	☐
Mash-up	☐	☐
Content Management Systems (CMS)	☐	☐
Syndication Systems (RSS)	☐	☐
Newsletter	☐	☐
Peer-to-Peer Resource Sharing (P2P)	☐	☐
Podcasting/Videocasting	☐	☐
Audio Conference/Video Conference	☐	☐
E-voting	☐	☐
Other (please specify) _____		

Marketing Tools	**Yes**	**No**
	1	*0*
Business-to-Business (B2B)	□	□
Business-to-Business (B2C)	□	□
Other (please specify) _____		

Search Optimisation Tools	**Yes**	**No**
	1	*0*
Search Engine Optimisation (SEO)	□	□
Search Engine Marketing (SEM)	□	□
Other (please specify) _____		

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Hermenegildo Gil-Gomez[a], Vicente Guerola-Navarro[a], Raul Oltra-Badenes[a] and José Antonio Lozano-Quilis[b]

[a]Department of Business Organization, Universitat Politècnica de València, Valencia, Spain;
[b]Department of Computer Systems and Computation, Universitat Politècnica de València, Valencia, Spain

ABSTRACT

The point of departure for this study is the understanding of customer relationship management (CRM) as a set of technological solutions key for efficient business management, the benefits of which, highlighted by previous works, are presented and defined here as crucial for entrepreneurial success. Of particular interest for this purpose are the existing studies on sustainability, which provide a viable research model to assess and validate the potential effect of each CRM component (sales, marketing, and services) on the three dimensions of sustainability (economic, environmental, and social). Upon confirmation of our hypotheses, the subsequent validation of such model should bring a better understanding of the way in which CRM-related benefits may increase the positive impact of its components on each dimension of sustainability. CRM can hence be considered a sort of Green IT, oriented toward digital transformation and sustainable business model innovation. Indeed, this research model may be the basis for a more specific methodology to measure the impact and benefits of applying CRM, understood, as we will contend, both in terms of sustainable business models and innovation.

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Introduction

This paper proposes a research model to analyse how customer relationship management (CRM) brings small and medium enterprises (SMEs) a dual benefit, in terms of both customer knowledge management (CKM) and innovation. This confluence of interests and benefits is a key point to consider CRM a critical tool for **business model innovation**, driving SME efforts toward **economic, social and environmental sustainability**. Traditionally, SMEs have been the cornerstone of the European economy, comprising over 99% of all European companies, and two thirds of the private-

sector jobs (European Commission, 2013). Thus the impact of CRM on SMEs is of special interest given the social and economic relevance of this sector.

Customer knowledge management and innovation are the two key modern-firm drivers for a set of successful survival, growth, and development strategies, enhancing business efficiency, performance, and sustainable competitive advantage (Pil & Holwelg, 2003). Indeed, knowledge has been defined as the most important strategic resource for (Eisenhardt & Martin, 2000), and even the core element of (Lusch, Vargo, & O'Brien, 2007), sustainable competitive advantage. Nonaka and Takeuchi (1995) argue that both innovation and competitiveness require knowledge. As result, Prahalad and Ramaswamy (2004) further state that knowledge and innovation are inalienable and inseparable. In this sense, operating Customer Knowledge Management through collaborative innovation shows an efficient path for knowledge-sharing, and therefore, successful innovation practices (Alegre, Kishor, & Lapiedra, 2013). Indeed, Prahalad and Ramaswamy (2004) understand customer collaboration as a modern anchor of customer knowledge management and innovation, as well as a system enabling successful organisations to learn from their customers' needs how to meet their demands and improve performance. This call to consolidating and integrating customer collaboration and customer-need knowledge is what CRM seeks to respond to as both a strategic tool and business philosophy for leading firms.

CRM emerged in the 1970s (Buttle, 2004) as a new tool for managing and optimising sales-force automation within companies. Eversince, it has become one of the most popular tools for enterprise information management, not only for sales and marketing purposes, but also for more effective Customer Interaction (King & Burgess, 2007) and customer knowledge management, as well as for the understanding of organisational behaviour. Chen and Popovich (2003) define customer relationship management as an integration of processes, human capital and technology seeking for the best possible understanding of a company's customers. Besides, if we place our focus particularly on customer retention and relationship management, CRM is the most recent integrational approach available for relationship management.

A firm willing to survive and improve its position in the market needs to excel both in its exploitative and exploratory innovation (Tushman & O'Reilly, 1997), despite the organisational tensions resulting from both trends (March, 1991). Such mix of current exploitation and prospective exploration is the principle for **sustainable business models** as the core of modern and dynamic businesses. In this light, the interest of the current study is clear: it intends to prove CRM an efficient technological solution to help companies in the current exploitation of their resources, as well as to explore and innovate in all areas leading to sustainable economic and financial growth.

The results of this research model, applied to any specific company, will show the impact of deploying and using customer relationship management, both in terms of customer knowledge management and innovation. The structure of this paper begins with a literature review revolving around the concept of CRM and its benefits. It is through these initial readings, dwelling on the modern concept of CRM and its impact on dynamic firms, translated both as technological and organisational change,

that we have understood the need to conduct further research on the two main variables of ambidextrous organisations: customer knowledge management (as the exploitation process), and innovation (the exploration process). Both areas will accordingly be studied and reviewed not only as isolated features, but also in their specific relationship to CRM.

Materials and methods

The initial part of our literature review pinpoints both the concept and acknowledged benefits of CRM, hence laying the foundations for future research seeking to measure the impact of CRM on key business indicators.

The second part of such review is then centred on two crucial variables of ambidextrous organisations, the first one being customer knowledge management, a core aspect of the exploitation process. Here, the relationship between customer knowledge management and CRM should also be considered since it could determine the actual benefits of implementing CRM in companies.

The second main variable involved in our review is innovation, analysed in combination with CRM as a skill with direct and valuable impact on the latter. Innovation has proven the most relevant dimension when working with CRM as key tool to attain sustainable business models, critical as it may be to ensure the prospective sustainability and increase of its up-to-date related benefits.

CRM: concept and benefits

Customer relationship management comprises a set of software tools specially devised to command the three axes of firm-customer relations (Chen & Popovich, 2003): sales, marketing, and services.

In fact, Scullin, Allora, Lloyd, and Fjermestad (2002) state that electronic CRM has become the latest paradigm in the world of customer relationship management, as modern companies have understood the need to evolve in an environment-sensitive manner to succeed with their marketing strategies. Since its emergence, CRM has had the globally accepted, primary goal of both attracting and retaining economically valuable customers, while leaving the less profitable ones aside (Romano, 2000). Considering the linearly growing interest in CRM since the 1970s, Romano and Fjermestad (2002) have considered it one of the most important areas of study for applied sciences in the near future. In today's world, with online market trade constantly growing, it's become critical to gather, analyse and process all customer data that SMEs may be able to collect in order to turn first-time online purchasers into loyal customers. Such challenge is underscored by a study from the Boston Consulting Group, indicating that 65% of online customers making a first-time purchase on a given website will never purchase again from it. On his part, Sims (2000) has shown that CRM is a very valuable tool for web-enabled companies to fill the service gap discouraging users from purchasing anew on the same online outlet after a first time.

CRM enhances a company's capability to coordinate marketing and service strategies in the means of reaching and retaining long-term partnerships (Sin, Tse, & Yim, 2005). Since the basic strategic goals of each organisation include long-term growth and sustainability (Pohludka, Stverkova, & Ślusarczyk, 2018), the need to meet customer needs and demands, as well as to improve customer satisfaction is considered the main CRM target (Aggarwal, 1997; Claycomb, Droge, & Germain, 1999). In this sense, Joo (2007) has stated that a customer-centered focus is key for business success in the modern market world, its underlying principle being that a good CRM strategy can be reached by enhancing customer loyalty (Huang & Lin, 2005).

The implementation and use of CRM in SMEs brings direct benefits in terms of both financial performance and daily business activity. In other words, improvements in the overall customer experience lead to greater customer satisfaction, which in turn has a positive effect on the company's profitability (Scullin et al., 2002), with the following particular gains: increased customer loyalty; a more effective marketing strategy; improved customer service and support; greater efficiency; and cost reduction.

Regarding Customer Loyalty, CRM allows companies to centralise and integrate both their transaction records and customer data, making this information accessible and manageable to all key stakeholders in order to identify the loyalest customers (Epiphany.com, 2001) and the most effective marketing activities. Waltner (2001) considers personalisation software tools as one of the key elements for increased customer loyalty. Most definitely, in today's highly competitive market ecosystem there is a growingly critical need for SMEs to diversify the risk of losing major customers (Arsić, Banjević, Nastasić, Rošulj, & Arsić, 2018).

Marketing becomes more effective when firms deploy CRM due to the highly detailed customer information gathered through interaction. This information allows customer decision-making prediction, which translates into more effective and personalised marketing campaigns for successful companies, with a higher impact on their sales and profitability (Greenberg, 2001). In fact, Rong, Wang, and Liao (2001) have argued that customer information can facilitate customer segmentation and thus make marketing efforts more effective, because grouping customers according to their market needs allows companies to reach target groups through segment-tailored marketing efforts.

Customer Service and Support is another market feature subject to enhancement through CRM, encouraging a thorough understanding of consumer needs, and hence leading to better ways of meeting them (Fruhling & Siau, 2007). Actually, CRM can simplify a company's remote processes of order reception, update, and placement. On the other hand, CRM allows it to keep an ongoing register of project investment, comprising materials, expenses, and time consumption. Finally, it gives access to a customer service agreement database. All of these enhanced capabilities are integrated to keep customers exactly where they belong: at the centre of the company's strategy (Scullin et al., 2002).

CRM is part of a broader, data-mining set of management software tools and solutions. Therefore, it facilitates data analysis in order to find detailed, market-relevant

information for more successful decision-making processes (Whatis.com, 2001). Besides, integrating all information in a single database allows all of the company's stakeholders to discard misleading data, as well as to have a consistent and unified source of information, a key feature to improve efficiency, reduce any costs related to data access, analysis, and exploitation, and hence reach better marketing decisions (Fruhling & Siau, 2007). CRM comprises not only software or technology, but also strategic knowledge, which makes it a global solution for more accurate data analysis and better business decisions (Krizanova, Gajanova, & Nadanyiova, 2018).

CRM and customer knowledge management

Managing customer knowledge, essential as it is for SMEs, relies on two specific strategic resources: customer knowledge management (CKM hereafter) and customer orientation (CO) (Fidel, Schlesinger, & Esposito, 2018). Fidel et al. (2018) argue that Innovation Orientation (IO) usually operates as an essential, highly effective mediator between CO and CKM. Both customer collaboration and innovation orientation have a clear impact on CKM and on the firm's marketing results, which leads us to consider them key factors to improve business performance through the perfection of customer knowledge (Fidel, Schlesinger, & Cervera, 2015). CKM is also an important strategic resource with a considerably positive influence on marketing operations (Huang & Shih, 2009), even outstripping that of Innovation Orientation (Fidel et al., 2015). In our view, this shows the importance of implementing coordinated strategies to increase accumulated customer knowledge.

CKM is therefore a combination of organisational tools, practices, and soft skills focussed on how to create, accumulate and transfer customer-related knowledge (Alegre et al., 2013). Because the SMEs' usual lack of human capital restrains their internal drive of knowledge (Gibbert, Leibold, & Probst, 2002; Robson & Bennett, 2000), CKM becomes a strategic resource in order to create customer value. Chua and Banerjee (2013) consider the accumulation of both general knowledge and CKM one of the basic factors improving competitive advantage in this type of firms. Thus, the relationship between CKM and innovation has outlined quite a new area of study (López-Nicolás & Molina-Castillo, 2008), offering a great opportunity to develop and elaborate these concepts and their impact, both on business excellence (Rollins & Halinen, 2005), and more notably on the increase of SME competitive advantage (Chua & Banerjee, 2013). Some studies have been conducted regarding the impact of CKM on business and projects (Chua & Banerjee, 2013; Fruhling & Siau, 2007; Gorry & Westbrook, 2013; July-Abid & Ali, 2014; Lin, Che, & Ting, 2012; Sofianti, Suryadi, Govindaraju, & Prihartono, 2013). More recently, Fidel et al. (2018) have studied its influence on business innovation capabilities.

The current globalisation trends demand that leading companies take up new competitive challenges, underscoring the need to focus on managing customer relationships, and especially on customer satisfaction as the main way to survive and maximise revenues (Constantinos, Christos, & Stafyla, 2003). These modern challenges have encouraged leading firms to adopt a new, customer-centered orientation (Bose, 2002), at the heart of the so-called relationship marketing, which implies an

evolution from the transactional orientation of traditional marketing to the modern discipline's focus on a relational one. Relational marketing centres marketing efforts on developing and reinforcing long-term relations with customers through a continuous improvement of customer service, carrying a high impact on customer satisfaction (Garbarino & Johnson, 1999). Leading organisations rely on CRM software systems to track and analyse customer-related information since their relations with customers can be greatly improved by using Information Technology (IT) (Karimi, Somers, & Gupta, 2001). Customisation is the essence of a customer-centered orientation of marketing strategy, and it can be reached by deploying and adapting CRM to customer needs and particularities (Dewhurst, Martinez-Lorente, & Dale, 1999). CRM seeks to expand customer-related knowledge, as well as it encourages its effective use to supervise consumers' purchase experiences, revenue growth and profitability. CRM is also considered a privileged management approach aimed at the identification, attraction, further development and retainment of successful customer relations, ultimately devoted to increasing profitable-customer loyalty (Bradshaw & Brash, 2001; Massey, Montoya-Weiss, & Holcom, 2001). Successful firms have discovered how to efficiently drive their marketing efforts by prioritising customers generating high revenues instead of inactive or irrelevant ones, which makes customer-tailored strategies indispensable. CRM enables companies to deploy such strategies by managing individual customer relations with the support of customer databases and interactive, mass customisation technologies (Verhoef & Donkers, 2001). Given that a sufficient and continually updated customer knowledge is critical for an effective CRM system, (Constantinos et al., 2003) CRM has definitely developed strong ties with the discipline of customer knowledge management (Massey et al., 2001; Romano, 2000)

CRM and innovation

Innovation is defined as a set of ideas, practices, or objects perceived as groundbreaking by either an individual or a group of people (Fruhling & Siau, 2007; Hsu, 2006). Innovation capabilities refer to an organisation's application of technology in the means of developing pioneering systems, policies, software, products, processes, devices, or services (Chang & Lee, 2008; Damanpour & Evan, 1984). Such capabilities also integrate a company's ability to assimilate and utilise external data to obtain success-oriented knowledge and business information (Cohen & Levinthal, 1990).

SMEs can improve their CKM through two main variables: customer orientation (CO hereafter) and innovation orientation (IO hereafter) (Fidel et al., 2018). An integrated and balanced approach to CKM and CO practices is absolutely critical for a successful CRM deployment (Gholami et al., 2018), both variables being essential resources for the company (Cantner, Joel, & Schmidt, 2009). When consistently integrated and treated as a global strategy, these three resources (CKM, CO and IO) may definitely improve the SMEs' capabilities, such as their innovation skills, as well as improve their results, e.g. in marketing terms, while retaining their competitive advantages (Grawe, Chen, & Daugherty, 2009; Lin et al., 2012; Pil & Holwelg, 2003; Rao & Drazin, 2002; Soliman, 2011; Zhu & Nakata, 2007).

Menguc and Auh (2006) consider IO to be an organisational resource, equally contributing to increasing and maintaining competitive advantage (Hult & Ketchen, 2001). On their part, Hult, Hurley, and Knight (2004) consider IO as a key factor to achieve successful companies (Pil & Holwelg, 2003). Finally, Pil and Holwelg (2003) underscore its leading role in SME success as innovation-centered performance allows companies to improve their competitiveness through an orientation shift.

Innovation processes are the most important element for an innovative system (Fidel et al., 2018). Innovation helps companies to improve their performance by encouraging them to create, assess and develop novel and useful products, services and practices, hence creating and retaining value for internal and external stakeholders, and generating new sources of income (Dervitsiotis, 2010).

Organisational innovation is particularly critical for SMEs, and especially for small firms (Gallego, Rubalcaba, & Hipp, 2013). In order to exploit the existing market opportunities, the latter need to stay in line with the constantly evolving customer needs, and this requires certain innovation capabilities (Ngo & O'Cass, 2012). Additionally, Díaz, Aguiar, and Saá-Pérez (2006) consider this a key element to achieve competitive advantage.

In an era of continuous change, where products, processes and services are constantly evolving to adapt market value to customer needs and market demands, manufacturers and service providers need to enhance their innovation capabilities to sustain competitive advantage (Panayides, 2006). Indeed, today's highly unpredictable, changing customer needs can only be met by successful companies through product and service innovation (Shane & Ulrich, 2004). Hence, CRM facilitates a firm's gathering, analysis, and exploitation of knowledge related to customer needs and preferences, enjoying as it does wide recognition for boosting innovation and ensuring long-term competitive advantage (Ramani & Kumar, 2008; Sahay & Ranjan, 2008).

Ru-Jen, Chen, and Chiu (2010) have pinpointed the effects of several CRM dimensions on innovation capabilities. For this purpose, CRM is described as comprising five different dimensions (information sharing, customer involvement, long-term partnership, joint problem-solving, and technology-based CRM), and their related innovation capabilities: product innovation, process innovation, administrative innovation, marketing innovation, and service innovation. Product innovation is defined by Liao, Fei, and Chen (2007) as the development and launch, either of new products as a whole, or of groundbreaking functions, quality, consistency or appearance for existing products. Process innovation refers to any shifts in production processes pioneering more productive systems for good manufacturing or service provision (Damanpour, 1996). Marketing innovation comprehends all strategies enabling more efficient customer-targeting operations (market research, segmentation, and information systems; price-setting strategy; advertising campaigns), as defined by Vorhies and Harker (2000) and Weerawardena (2003). On their part, Gopalakrishnan and Damanpour (1997) descibe service innovation as the modern manufacturers' growing engagement with improved customer satisfaction, after-sales services, guarantee policies, maintenance routines, and order placement systems. Administrative innovation is understood as a set of activities involving changes in organisational structures or administrative processes, such as human resource policies for recruitment and allocation, task assignation and reward

policies (Gopalakrishnan & Damanpour, 1997). Innovation in production and IT processes favours an ambidextrous performance, whereas changes in logistics systems, despite being positive, are less relevant (Arsić et al., 2018).

Each company shows contrasting degrees of CRM development and command, which leads us to predict a differential, CRM-related impact on each innovation capability (Ru-Jen et al., 2010). The clearest CRM influence, with positive effects in all five types of innovation, comes from technology-based initiatives. However, it may consequently be argued that not all CRM activities contribute to innovation programmes positively. Thus, there is a strong need to supplement CRM with other elements, such as supplier information.

Results

After an exhaustive literature review, we may conclude that most existing studies have successfully described the benefits of CRM implementation on firm performance. Nevertheless, a consolidated approach to the aforementioned, exploitation-exploration duality of present and future CRM benefits remains undertheorized. Taking these bifold benefits as a starting point, the present paper intends to present a research method aimed at determining whether CRM is indeed a technological solution within the scope of sustainability and sustainable business models.

Benefit maps of CRM in the present and the future

To summarise our concluding remarks from the previous theoretical discussion, the following map (Figure 1) represents the benefits expected of CRM implementation,

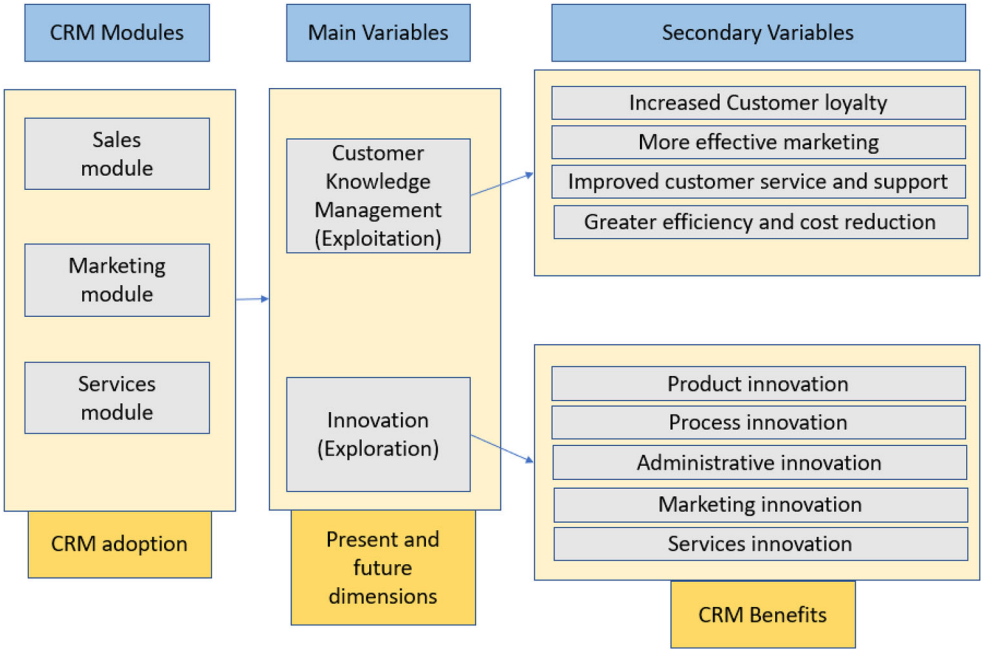

Figure 1. CRM benefit map.

both in terms of current exploitation (customer knowledge management), and prospective exploration (innovation):

From a compositional perspective, CRM comprises three different aspects: sales, marketing, and services (Buttle, 2004). Operated jointly, these three tools pursuit the main objective of devising an effective CRM strategy, encouraging customer loyalty enhancement (Huang & Lin, 2005).

CKM (customer knowledge management) refers to organisational performance, and, more specifically, to the currently observable, CRM-related set of benefits, whereas innovation makes reference to the prospective, advantages expected as a result of investing on process improvement.

In this sense, our literature review has also shed light on the absence of perspectives directly relating CRM to sustainability, as well as on the lack of interest regarding the exploitation-exploration blend as a bifold trend for sustainable development.

Research model

The previous research gaps clearly underscore the need for a set of methodological principles allowing us to draw connections between all CRM-related benefits, current and future, and a sustainable business model guaranteeing its long-term economic, social, and environmental efficiency.

While departing from the acknowledged benefits of CRM for SMEs, this paper also intends to demonstrate whether CRM could be considered an anchor of sustainability among the different technological solutions available for enterprise management. In the following sections, we will present readers with several hypotheses upon the impact of CRM implementation on the three main dimensions comprised by average sustainable business models. The research model proposed in this paper may be used at any time, in any sector or given company, to determine how CRM deployment can encourage a sustainable business model.

Sustainability and CRM

The World Commission on Environment and Development (1987) defines sustainability as the 'development that meets the needs of the present without compromising the ability of future generations to meet their own needs'. Its three main dimensions, also known as the 'triple bottom line', are the following: economic, environmental, and social. Economic sustainability takes place when a balance has been reached between the pursuit of economic performance and its sustainable development (Abson et al., 2017). Environmental sustainability relates to the influence of an organisation's business processes, activities, and operations on its natural environment, this influence being either positive or negative (Mishra, Akman, & Mishra, 2014). Finally, social sustainability encourages a solid partnership between business and society for a sustainable development. In other words, a win-win situation is sought with this last dimension.

Proposed model

The current section presents our general research model, aimed at determining how the benefits of CRM deployment may contribute to boost different sustainability variables, as illustrated in Figure 2.

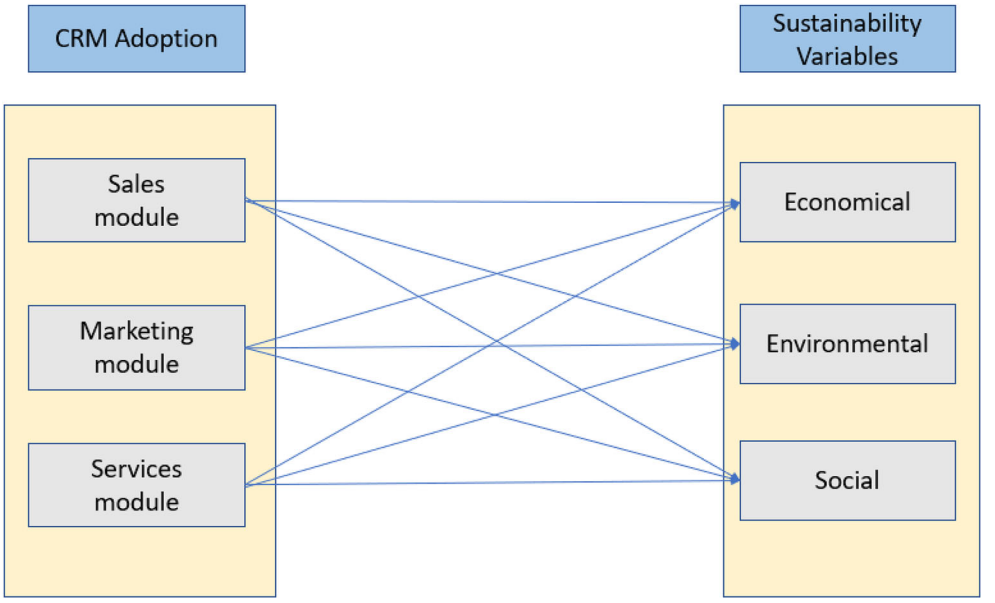

Figure 2. Proposed research model.

Our departing hypotheses refer to the impact that the implementation and use of the three CRM modules (sales, marketing, and services) may bear on the three sustainability focuses: economic, environmental, and social. After a consistent, CRM-themed literature review, and given the absence of direct references linking CRM with Sustainability, we have concluded that a potential research interest may lie behind such absence. According to our view, the total amount of connections to be drawn from the three major CRM components (sales, marketing, and services) translates into nine different hypotheses dealing with core aspects of business sustainability.

Model hypotheses

Below are the aforementioned nine hypotheses of our research model, which, if confirmed, would enable us to conclude the acceptance of CRM as a sustainable technological solution in the three areas: economic, social and environmental.

Hypothesis 1. The effective use of the CRM sales module affects the company's level of economic sustainability.

Regarding economic sustainability, CRM could be considered a key tool and a profitable solution for more sustainable business models. Morvay (2008) has acknowledged the ability to achieve consumer loyalty through a heavy investment in customer relationship management systems (CRM). This is accomplished by investing in Research and Development (R&D), as well as by innovating in disruptive technologies and Management Information Systems (MIS). It thus seems evident that the use of CRM can positively advance the implementation of sustainability within an organization (Christofi, Leonidou, & Vrontis, 2015), but not a single piece of literature so far has been devoted to providing direct demonstrations thereof. From our perspective, a deeper sort of analysis may outline that the CRM sales module should not only shed

light on the actual level of survival of a company's financials, but also set the foundations for a future, sustainable growth of economic profitability.

Hypothesis 2. The effective use of the CRM sales module affects a company's level of environmental sustainability.

In environmental terms, Molla and Abaresh (2011) define Green IT as a set of practices oriented towards environmental sustainability under different forms (including pollution prevention, product stewardship, and sustainable development in IT management). There is growing awareness among researchers and practitioners of the organisations' ecological responsibilities (Chen, Boudreau, & Watson, 2008). In this light, CRM appears to be a key solution to reduce the environmental impact of management decisions given its decisiveness on, for instance, paper-saving processes (McKenzie & Liersch, 2011). Nevertheless, we've been unable to find any scholarly works considering CRM a relevant set of Green IT solutions. Hence, the first goal of this study is to advocate for the reduction of paper-based management processes. In second place, it is also aimed at expanding the narrow-sighted connections between CRM and Green IT. Thirdly, it intends to underscore the crucial role of CRM on the reduction of the environmental impact caused by a company's regular activity.

Hypothesis 3. The effective use of the CRM sales module affects a company's level of social sustainability.

Finally, in social terms, the understanding of CRM as a management solution, allowing the centralisation of customer data on a single database with unified access, could also be a key point for common-good management theories, due to the subsequent achievement of more efficient inter-company processes in the context of customer-vendor relations (Meyer & Schwager, 2007). Again, no literature can be found on the social dimension of the relationship between CRM and sustainability. Hence, our research model should verify whether an effective connection exists between the use of CRM and the social common good resulting from an accessible, unified set of sales data from all related stakeholders (customers, vendors, and the company itself).

Hypothesis 4. The effective use of the CRM marketing module affects the company's level of economic sustainability.

CRM systems contribute to actively develop and steadily increase customer loyalty (Morvay, 2008), indeed a crucial requisite for a sustainable business model (Christofi et al., 2015). Once again, no scholarly works so far have considered a potential direct link between the application of the CRM marketing module and firm economic sustainability. This hypothesis should allow us to verify whether the use of the CRM marketing component may bear a real effect on a sustainable business model. This appears to be a sensible prospection since processing and systematically storing all customer and marketing-related data on a unified database may fructify the company's marketing efforts toward target customers, while increasing customer loyalty, and consequently economic sustainability.

Hypothesis 5. The effective use of the CRM Marketing module affects a company's level of environmental sustainability.

Environmental sustainability implies the implementation of effective solutions carrying a positive impact on a business' ecological dimension. As mentioned before, Green IT is defined by Molla and Abaresh (2011) as a set of practices oriented

towards environmental sustainability, among which we may include pollution prevention, product stewardship, and sustainable development in IT management. However unprecedented understanding CRM as a Green IT solution may be, this paper is proposing the layout of a model where the use of a consolidated marketing-action database shows the path toward a drastic reduction of paper-based processes (McKenzie & Liersch, 2011), as well as the extensive use of time-saving procedures. Understandably, such savings may be essential for a truly sustainable business model.

Hypothesis 6. The effective use of the CRM Marketing module affects the company's level of social sustainability.

Meyer and Schwager (2007) show the potential improvement that an efficient management of both vendor and customer-related information may bring to any given commercial relations. A specific tailoring of both marketing campaigns and actions to reach target customers involves a huge amount of information, which may be considered common good and the key aspect to a company's sustainable and social management model.

Hypothesis 7. The effective use of the CRM services module affects a company's level of economic sustainability.

Quite evidently, customer service excellence appears to be the backbone of customer loyalty, since a truly trustworthy company in terms of customer needs, expectations, and requirements must be able to ensure a great customer experience, which may in its turn enhance the aforementioned customer allegiance. CRM is a customer-service-oriented tool, placing the customer's voice at the centre of the company's efforts, thus clarifying the positive connection between CRM and consumer loyalty (Morvay, 2008) through a powerful services module. In other words, customer loyalty is at the very core of economic sustainability, which leads us to a new hypothesis, drawing a connection between the CRM services module and financial sustainability.

Hypothesis 8. The effective use of the CRM services module affects a company's level of environmental sustainability.

Molla and Abaresh (2011) have successfully linked Green IT with environmental sustainability, which is one of the main benefits that CRM implementation may bring to a firm. The introduction of CRM should save time, effort, paper, and all kind of resources with which an environmentally sustainable business activity should dispense. In line with this, a final hypothesis may relate and show the effect of CRM implementation on the ecological side of the entrepreneurial results.

Hypothesis 9. The effective use of the CRM services module affects a company's level of social sustainability.

Considering the impact of CRM-related efficiency on managerial processes, it's quite intuitive to conceive CRM as an important solution in the pursuit of common-good relations between customers and vendors (Meyer & Schwager, 2007). The impact of applying the CRM Services module for social sustainability purposes could hence be measured by quantifying the correlation between customer service improvement, the increase of customer-vendor trust, and the efficiency of service-process management.

Conclusions

This study has conceived and devised a research model to empirically validate the effects of the three CRM components (sales, marketing, and services) on customer

knowledge management and innovation, as well as on the companies' efforts toward digital transformation and sustainable business model innovation. For this purpose, we've taken as a starting point the CRM-benefit map illustrated above, comprising two different paths: a set of current-exploitation patterns for organisational performance, plus an explorative one for prospective innovation, leading the way to a sustainable business model for the future. Our research model has been built up in accordance with each potential combination between the three CRM modules and the three sustainability dimensions (economic, environmental, and social).

Companies, and particularly small- and medium-size ones (SME), are willing to enhance their data-processing potential through the adoption of efficiency- and success-oriented technologies and solutions. CRM is one of the modern information systems (IS) available in the means of providing business decision-makers (BDM) with valuable business data, especially concerning the three CRM-related areas: sales, marketing, and services. Thus, the goal of this paper's research model is to set up a structure and a series of plausible hypotheses applicable to a future empirical study for validating the effects of CRM-component influence on the three sustainability dimensions.

Upon confirmation of such hypotheses, the subsequent validation of this model may contribute to our understanding of the process whereby CRM-related benefits enable a positive, enhancing correlation between each CRM component and each sustainability dimension. In this light, CRM must be considered a specific typology of Green IT for digital transformation and sustainable business model innovation.

Regarding the CRM-benefit map, and the first main variable, customer knowledge management, four other variables must be acknowledged as bearing a relevant impact on business results, the measurement of which must be addressed in a more specific research model. Considering the influence of such variables on business indicators, and the way CRM allows their fulfilment as desirable goals, our research model may empirically demonstrate how CRM helps firms to succeed through a consistent and well-structured customer knowledge management strategy. A first, positive outcome is the increase of customer loyalty, the effectiveness of which portrays a customer-centered, and therefore successful firm on the grounds of relational marketing principles. A second beneficial effect lies on the enhancement of marketing-strategy effectiveness, since CRM may provide internal marketing stakeholders with key information in order to plan out and opt for the most effective campaigns and marketing actions for customer targeting. An improved customer service and support is the third CRM-related benefit, directly connected to the services area, and a crucial factor to ensure a company's retaining of its best customers through an efficient, target-retention strategy based on an enhanced post-sales customer experience. Lastly, a fourth related advantage lies in the development of efficiency-boosting and cost-reductive capabilities, given the need for a surviving company to adapt its sales, marketing and service efforts to certain goals and specific customer features, hence modulating its offer on the grounds of a realistic perception of market demand, and achieving efficiency and success

In regard with the second path of our benefit map, revolving around the innovation variable, five core axes have been considered: product, process, administrative, marketing, and services. All five describe how companies drive their efforts toward an

effective investment on the enhancement of both internal and external business processes. In this sense, an empirical validation of our proposed research model may allow researchers to quantify the impact of each axis on the development and implementation of pioneering and efficient sales, marketing, and service policies.

Despite the overall academic and business contributions of this study, some limitations must also be acknowledged. First, the research model laid out in these pages is a general, basic one, to be supplemented with certain assessment indicators, allowing model validation within specific sectors and business environments. Second, whereas this study understands CRM as the combination of three main components (sales, marketing, and services), it has not considered some second-level, potentially adjacent or accessory elements. Third, each CRM component has been dealt with in a standardised, and thus comparable depth, hence leaving aside the differences between each CRM provider and/or manufacturer.

Finally, in terms of future research lines, this model could be elaborated into a more specific methodology, fit for any given sector and/or enterprise standards, in order to validate and empirically assess the effect of each CRM strategy on a company's general business results.