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Tesis Doctoral:

Impacto del grado de implementación del Customer Relationship Management (CRM) y la Estrategia de Innovación en los resultados empresariales. Aplicación al sector vitivinícola español.

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Título: "Impacto del grado de implementación del Customer Relationship Management (CRM) y la Estrategia de Innovación en los resultados empresariales. Aplicación al sector vitivinícola español."

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RESUMEN

El mercado y las transacciones comerciales se desarrollan en la actualidad en un entorno cada vez más dinámico y cambiante, que obliga a las empresas a adaptarse a expectativas cada vez más específicas y exigentes por parte de los clientes, y a una competencia feroz por mantener y ampliar la ventaja competitiva para poder subsistir. La fidelización de los clientes, y el establecimiento de relaciones comerciales duraderas con ellos a largo plazo es una de las formas más eficientes a través de las cuales las empresas pueden conseguir estos objetivos. Para ello es fundamental tener la mejor información posible sobre los clientes, así como establecer estrategias coherentes para la gestión de las relaciones con ellos. Poner al cliente como foco y centro de toda la cadena de valor de las empresas asegura que, desde la toma de requerimientos para satisfacer las necesidades de los clientes, hasta la provisión de bienes y servicios que satisfagan dichas necesidades, pasando por todas las etapas de su proceso productivo, están diseñadas y orientadas a conseguir la máxima satisfacción del cliente y con ello su fidelidad y una relación comercial duradera y beneficiosa.

Las Tecnologías de Información y Comunicación (TIC) son clave para cualquier estrategia dirigida a la consecución de estos objetivos, tanto por su potencia en el manejo de la información valiosa de gestión empresarial, como por el cambio cultural que introducen en las empresas que adoptan estos sistemas en su camino hacia la transformación digital. En las últimas dos décadas ha crecido especialmente el interés por una de estas tecnologías, en concreto los sistemas Customer Relationship Management (CRM), cuyo ámbito de trabajo es la gestión de las relaciones con los clientes.

CRM nace en los años 70 con el objetivo de automatizar la fuerza de ventas de las empresas, es decir, sistematizar e informatizar los procesos comerciales en tres áreas: ventas, marketing, y servicios. El objetivo primero de CRM era que toda acción emprendida por cualquiera de los agentes de la empresa, en cualquiera de estas tres áreas de gestión de relaciones con los clientes, estuviera registrada y accesible para el resto de los agentes clave de la empresa. Con CRM se conseguía unificar y tener de forma coherente y consistente toda la información de gestión de relaciones con los clientes.

El dinamismo y competitividad de los mercados, alentado por la globalización y el acceso a información y mercados diversos y dispersos, ha movido a las empresas a buscar estrategias de gestión que hagan sostenibles en el tiempo sus ventajas competitivas. CRM se ha mostrado como una de estas herramientas más valiosas, aportando expectativas no solo de beneficios de explotación actual por su gestión de la información relacionada con la gestión del conocimiento sobre los clientes, sino también de beneficios a futuro por su directo impacto en los procesos de innovación. Una vez definidos cuales son los beneficios esperados por parte de las empresas que

deciden implementar sistemas CRM, se plantea la cuestión de saber en qué condiciones estos beneficios se suelen dar en la realidad. El presente trabajo de investigación ha pretendido comprobar cuáles son las condiciones que pueden hacer que el uso CRM por parte de las empresas venga acompañado consecuentemente de mejoras en los resultados empresariales, de modo que las conclusiones ayuden a las empresas a tomar sus decisiones sobre su adopción de dichos sistemas CRM.

La investigación se ha iniciado con un estudio bibliométrico cuyo objetivo ha sido detectar cuales han sido hasta la actualidad los focos de investigación (autores, países, entidades, etc.) más productivos (con mayor número de publicaciones) y los más influyentes (cuyos artículos han sido más citados). En este estudio se ha resaltado cuales han sido los artículos más citados, por lo cual más influyentes, y que por tanto se han revisado con mayor detenimiento. Este estudio bibliométrico se ha complementado con una revisión de literatura, obteniendo un estado del arte completo y amplio sobre el que desarrollar el estudio. En esta revisión de la literatura se ha incluido ya la variable "innovación", con el objetivo de resaltar la sostenibilidad en el tiempo (y de cara a futuro) del impacto de CRM. El paso siguiente ha sido crear un modelo de investigación, para lo cual se ha investigado cuales son los beneficios esperados, tanto presentes (a través de la gestión del conocimiento sobre el cliente) como futuros (a través de la innovación), del uso de CRM por parte de las empresas. Finalmente se ha elegido un sector representativo de la economía española, en concreto el de la producción y distribución de vinos, para comprobar empíricamente qué condiciones son necesarias y/o suficientes para asegurar que el uso de CRM y los procesos de innovación relacionados traen consigo mejoras en los resultados empresariales. Este sector, altamente representativo de la economía y tradición española, se ha elegido porque la tipología de sus empresas (pequeñas y medianas, familiares en su mayoría) hacen especialmente difícil su proceso de transformación digital, por lo que se espera que las conclusiones obtenidas ayuden a las empresas del sector a confiar en CRM como tecnología clave en su proceso de transformación digital y de mejora de competitividad.

La conclusión general del estudio es la confirmación de que una buena cultura de gestión de la relación con los clientes ("customer relationship management") es clave para tener un buen resultado empresarial, ya que está en línea con las teorías modernas del marketing relacional que se enfocan en la gestión centrada en el cliente. A esta relevancia de la cultura de gestión centrada en el cliente, se agrega que el uso de tecnologías CRM puede y debe ayudar a mejorar el desempeño de la empresa. Una adecuada estrategia de innovación aparece como el complemento ideal para las estrategias de uso de la cultura y las tecnologías CRM en aras de mejorar los resultados empresariales.

Title: "Impact of the degree of implementation of Customer Relationship Management (CRM) and the Innovation Strategy on business results. Application to the Spanish wine sector. "

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SUMMARY

The market and commercial transactions are currently developing in an increasingly dynamic and changing environment, which forces companies to adapt to increasingly specific and demanding expectations from customers, and to a fierce competition to maintain and expand the competitive advantage in order to survive. The loyalty of customers, and the establishment of lasting business relationships with them in the long term is one of the most efficient ways through which companies can achieve these objectives. For this purpose, it is essential to have the best possible information about customers, as well as to establish coherent strategies for managing relationships with them. Putting the client as the focus and center of the entire value chain of companies ensures that, from the study of requirements to satisfy the needs of clients, to the provision of goods and services that satisfy said needs, passing through all stages of its production process, are designed and oriented to achieve maximum customer satisfaction and with it their loyalty and a lasting and beneficial business relationship.

Information and Communication Technologies (ICT) are key to any strategy aimed at achieving these objectives, both because of their power in handling valuable business management information, and because of the cultural change they introduce in companies that adopt these systems on their way to digital transformation. In the last two decades, interest in one of these technologies has grown especially, specifically the Customer Relationship Management (CRM) systems, whose scope of work is the management of customer relationships.

CRM was born in the 70s with the aim of automating the sales force of companies, that is, to systematize and computerize business processes in three areas: sales, marketing, and services. The first objective of CRM was that any action taken by any of the company's agents, in any of these three areas of customer relationship management, be registered and accessible to the rest of the company's key agents. With CRM it was possible to unify and have in a coherent and consistent way all the information on customer relationship management.

The dynamism and competitiveness of the markets, encouraged by globalization and access to information and diverse and dispersed markets, has prompted companies to seek management strategies that make their competitive advantages sustainable over time. CRM has proven to be one of these most valuable tools, providing expectations not only of current operating benefits due to its management of information related to customer knowledge management, but also future benefits due to its direct impact on processes of innovation. Once the expected benefits of companies that decide to implement CRM systems have been defined, the question arises of knowing under what conditions these benefits usually occur in reality. The present research work has tried to verify which are the conditions that can make the use of CRM by companies consequently accompanied by improvements in business results, so that the conclusions help companies make their decisions about their adoption of such CRM systems.

The research has started with a bibliometric study whose objective has been to detect which have been the most productive research focuses (authors, countries, entities, etc.) (with the largest number of publications) and the most influential (whose articles have been most cited). In this study, it has been highlighted which articles have been the most cited, which is why they are more influential, and which have therefore been reviewed in greater detail. This bibliometric study has been complemented with a literature review, obtaining a complete and comprehensive state of the art on which to develop the study. In this review of the literature, the variable "innovation" has already been included, in order to highlight the sustainability over time (and in the future) of the impact of CRM. The next step has been to create a research model, for which the expected benefits, both present (through knowledge management about the client) and future (through innovation), of the use of CRM by companies. Finally, a representative sector of the Spanish economy has been chosen, specifically that of wine production and distribution, to empirically check what conditions are necessary and / or sufficient to ensure that the use of CRM and related innovation processes bring improvements. in business results. This sector, highly representative of the Spanish economy and tradition, has been chosen because the typology of its companies (small and medium-sized, mostly family-owned) make its digital transformation process especially difficult, so it is hoped that the conclusions obtained will help companies in the sector to trust CRM as a key technology in their process of digital transformation and improvement of competitiveness.

The general conclusion of the study is the confirmation that a good culture of customer relationship management ("customer relationship management") is key to having a good business result, as it is in line with modern theories of relationship marketing that they focus on customer-centric management. To this relevance of the customer-centric management culture, it is added that the use of CRM technologies can and should help improve company performance. An adequate innovation strategy appears as the ideal complement to the strategies for the use of culture and CRM technologies in order to improve business results.

Títol: "Impacte del grau d'implementació del Customer Relationship Management (CRM) i l'Estratègia d'Innovació en els resultats empresarials. Aplicació al sector vitivinícola espanyol."

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RESUM

El mercat i les transaccions comercials es desenvolupen en l'actualitat en un entorn cada vegada més dinàmic i canviant, que obliga les empreses a adaptar-se a expectatives cada vegada més específiques i exigents per part dels clients, i a una competència feroç per mantindre i ampliar l'avantatge competitiu per a poder subsistir. La fidelització dels clients, i l'establiment de relacions comercials duradores amb ells a llarg termini és una de les formes més eficients a través de les quals les empreses poden aconseguir aquests objectius. Per a això és fonamental tindre la millor informació possible sobre els clients, així com establir estratègies coherents per a la gestió de les relacions amb ells. Posar al client com a focus i centre de tota la cadena de valor de les empreses assegura que, des de la presa de requeriments per a satisfer les necessitats dels clients, fins a la provisió de béns i serveis que satisfan aquestes necessitats, passant per totes les etapes del seu procés productiu, estan dissenyades i orientades a aconseguir la màxima satisfacció del client i amb això la seua fidelitat i una relació comercial duradora i beneficiosa.

Les Tecnologies d'Informació i Comunicació (TIC) són clau per a qualsevol estratègia dirigida a la consecució d'aquests objectius, tant per la seua potència en el maneig de la informació valuosa de gestió empresarial, com pel canvi cultural que introdueixen en les empreses que adopten aquests sistemes en el seu camí cap a la transformació digital. En les últimes dues dècades ha crescut especialment l'interés per una d'aquestes tecnologies, en concret els sistemes Customer Relationship Management (CRM), l'àmbit de treball del qual és la gestió de les relacions amb els clients.

CRM naix en els anys 70 amb l'objectiu d'automatitzar la força de vendes de les empreses, és a dir, sistematitzar i informatitzar els processos comercials en tres àrees: vendes, màrqueting, i serveis. L'objectiu primer de CRM era que tota acció empresa per qualsevol dels agents de l'empresa, en qualsevol d'aquestes tres àrees de gestió de relacions amb els clients, estiguera registrada i accessible per a la resta d'agents clau de l'empresa. Amb CRM s'aconseguia unificar i tindre de manera coherent i consistent tota la informació de gestió de relacions amb els clients.

El dinamisme i competitivitat dels mercats, encoratjat per la globalització i l'accés a informació i mercats diversos i dispersos, ha mogut a les empreses a buscar estratègies de gestió que facen sostenibles en el temps els seus avantatges competitius. CRM s'ha mostrat com una d'aquestes eines més valuoses, aportant expectatives no sols de beneficis d'explotació actual per la seua gestió de la informació relacionada amb la gestió del coneixement sobre els clients, sinó també de beneficis a futur pel seu directe impacte en els processos d'innovació. Una vegada definits quals són els beneficis esperats per part de les empreses que decideixen implementar sistemes CRM, es planteja la qüestió de saber sota quines condicions aquests beneficis se solen donar en la realitat. El present treball de recerca ha pretés comprovar quines són les condicions que poden fer que l'ús CRM per part de les empreses vinga acompanyat conseqüentment de millores

en els resultats empresarials, de manera que les conclusions ajuden les empreses a prendre les seues decisions sobre la seua adopció d'aquests sistemes CRM.

La investigació s'ha iniciat amb un estudi bibliomètric l'objectiu del qual ha sigut detectar quins han sigut fins a l'actualitat els focus d'investigació (autors, països, entitats, etc.) més productius (amb major nombre de publicacions) i els més influents (els articles dels quals han sigut més citats). En aquest estudi s'ha ressaltat quals han sigut els articles més citats, per la qual cosa més influents, i que per tant s'han revisat amb major deteniment. Aquest estudi bibliomètric s'ha complementat amb una revisió de literatura, obtenint un estat de l'art complet i ampli sobre el qual desenvolupar l'estudi. En aquesta revisió de la literatura s'ha inclòs ja la variable "innovació", amb l'objectiu de ressaltar la sostenibilitat en el temps (i de cara a futur) de l'impacte de CRM. El pas següent ha sigut crear un model d'investigació, per a això s'ha investigat quals són els beneficis esperats, tant presents (a través de la gestió del coneixement sobre el client) com a futurs (a través de la innovació), de l'ús de CRM per part de les empreses. Finalment s'ha triat un sector representatiu de l'economia espanyola, en concret el de la producció i distribució de vins, per a comprovar empíricament quines condicions són necessàries i/o suficients per a assegurar que l'ús de CRM i els processos d'innovació relacionats porten amb si millores en els resultats empresarials. Aquest sector, altament representatiu de l'economia i tradició espanyola, s'ha triat perquè la tipologia de les seues empreses (xicotetes i mitjanes, familiars en la seua majoria) fan especialment difícil el seu procés de transformació digital, per la qual cosa s'espera que les conclusions obtingudes ajuden les empreses del sector a confiar en CRM com a tecnologia clau en el seu procés de transformació digital i de millora de competitivitat.

La conclusió general de l'estudi és la confirmació que una bona cultura de gestió de la relació amb els clients ("customer relationship management") és clau per a tindre un bon resultat empresarial, ja que està en línia amb les teories modernes del màrqueting relacional que s'enfoquen en la gestió centrada en el client. A aquesta rellevància de la cultura de gestió centrada en el client, s'agrega que l'ús de tecnologies CRM pot i deu ajudar a millorar l'acompliment de l'empresa. Una adequada estratègia d'innovació apareix com el complement ideal per a les estratègies d'ús de la cultura i les tecnologies CRM a fi de millorar els resultats empresarials.

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Índice

Capítulo 1 : Introducción

Introducción

La adopción y uso de las Tecnologías de la Información y Comunicación (TIC) por parte de las empresas es uno de los factores determinantes y más representativos de lo que se ha venido en llamar la Transformación Digital de las empresas, que puede ser definida como la capacidad de reinventar digitalmente el negocio para mantener la ventaja competitiva (Schwertner, 2017; Oltra-Badenes et al., 2018). La transformación digital se está convirtiendo de este modo en un cambio cultural, gracias al cual las empresas más avanzadas digitalmente persiguen su excelencia de gestión y el éxito en los mercados actuales, cada vez más dinámicos y competitivos. Los estudios más recientes efectivamente constatan que, al examinar el impacto de la transformación digital en la relación entre el uso de las TIC y el desempeño organizacional de la empresa, se demuestra que la transformación digital influye positivamente en la innovación y el desempeño organizacional (Nwankpa y Roumani, 2016).

Mithas y Rust (2016) confirma que una buena estrategia de transformación digital basada en la adopción y uso de las TIC, puede ser clave determinante para la consecución de objetivos tales como la expansión de ingresos, la reducción de costes o un énfasis dual en el que se persiguen ambos objetivos, todo ello como motor de una búsqueda de mejores resultados empresariales a través de un mejor desempeño organizacional. En la misma línea, Chen et al. (2016) concluye que se pueden esperar mejoras significativas en los resultados empresariales mediante el uso de las TIC más modernas, en especial las que se mueven dentro de las plataformas más innovadoras como el "Cloud computing".

Entre el conjunto de las TIC más populares, las soluciones tecnológicas de gestión empresarial más implementados y usadas por parte de las empresas más digitalizadas son los sistemas Enterprise Resource Planning (ERP), como herramienta básica de gestión integrada (Amini Valashani y Abukari, 2020; Oltra-Badenes et al., 2019; Vicedo et al., 2020). Destaca, al lado de los sistemas ERP, e íntimamente ligado a su funcionamiento y evolución, el gran desarrollo que han tenido los sistemas Customer Relationship Management (CRM), como herramienta de gestión de las relaciones con los clientes. Estudios recientes posicionan Customer Relationship Management (CRM) como mucho más que una herramienta de gestión de información, y le asignan un papel fundamental en las pequeñas y medianas empresas (PYMES) que aprovechan las dos dimensiones de CRM (la tecnológica y la cultural) para apoyar sus estrategias centradas en el cliente (AlQershi et al., 2020).

En la actualidad, y dado el auge de CRM como solución tecnológica clave para las PYMES en la gestión de sus relaciones con los clientes, se han creado y validado diferentes modelos de medición del impacto del uso de CRM sobre los resultados empresariales (conocido en el ámbito científico como "firm performance" o "desarrollo organizacional"). El uso de sistemas CRM se muestra como herramienta tecnológica clave para lograr y mantener la ventaja competitiva de las empresas. La innovación, en términos de adopción de CRM, es clave para obtener y mantener la ventaja competitiva de las empresas. Ser innovador depende de lo bien que las empresas conozcan las demandas cambiantes de los clientes, y por tanto es importante poder medir empíricamente los efectos de la adopción de CRM en el desempeño organizacional (Ullah et al., 2020).

Ullah y Narain (2020) propone y examina empíricamente un marco que relaciona el CRM y la cultura organizacional con el desempeño organizacional de la empresa; los resultados indican que el grado de esfuerzo empleado por las empresas para implementar CRM y el desarrollo de

culturas organizacionales orientadas al aprendizaje afectan positivamente al desempeño organizacional. Branner (2020) investiga los factores que hacen que CRM tenga un impacto positivo en las PYMES, creando un modelo multidimensional que refleja las variables que hacen de CRM una herramienta relevante en la consecución de un buen desempeño organizacional. Branner (2020) demuestra que los procesos de CRM centrados en el cliente, en los que las empresas se centran en la retención de clientes, la promoción de la venta cruzada y ascendente para los clientes existentes, y la gestión de las relaciones con los mismos, son una fuente sostenible de ventaja competitiva que contribuye a un desempeño organizacional positivo de las PYMES en términos de crecimiento y rentabilidad.

Justificada la relevancia del estudio del impacto de CRM y de la innovación sobre el desempeño organizacional (desempeño íntimamente ligado con los resultados empresariales), se plantea la necesidad de comprobar empíricamente dichos efectos e impacto. Esta comprobación empírica se puede afrontar, tanto desde el punto de vista del uso de herramientas tecnológicas CRM de gestión de relaciones con los clientes, como de la adopción de prácticas y cambios culturales enfocados al marketing relacional centrado en el conocimiento y satisfacción de las necesidades de los clientes.

Analizada la magnitud y volumen de negocio de los diferentes sectores productivos (medidos por su PIB), así como la representatividad e imagen de los mismos, junto con la demanda de este tipo de estudios por parte de especialistas en determinados sectores, se ha decidido realizar un estudio empírico en el sector de producción y distribución de vinos en España. El reto que ofrece este sector es su concentración en empresas categorizadas como PYMES, en gran medida empresas familiares y con dificultades estructurales para afrontar la transformación digital (OEMV, 2018).

Estudios previos prevén un impacto positivo del uso de CRM sobre los indicadores del desempeño organizacional, como por ejemplo en el sector eno-turístico del vino griego (Belias et al., 2018). Crescimanno et al. (2017) estudia el efecto del uso de CRM sobre el sector del vino italiano, enfocado en el impacto de uso de las redes sociales. Más concretamente en el sector del vino español, Ferrer-Lorenzo et al. (2017) indaga en las diferencias de desempeño de la empresa diferenciando entre grupos empresariales y PYMES, concluyendo que las grandes empresas tienen mayor facilidad de adopción de CRM (sobretodo como cultura y estrategia de gestión, y en menor medida como solución tecnológica).

En el presente estudio, vistos los antecedentes y la demanda de información del sector, se ha comprobado empíricamente cuales son las condiciones (así como su naturaleza, categorizada como de necesidad y/o suficiencia) que hacen que CRM e innovación impacten positivamente en el desempeño organizacional de las empresas del sector de producción y distribución de vinos en España.

1.- Antecedentes

La presente tesis doctoral es el fruto de un proceso de investigación acometido por el autor tras la experiencia adquirida durante más de veinte años de trabajo relacionado con las Tecnologías de Información y Comunicación (TIC).

Entre los años 1998 y 2018, el autor ha trabajado siempre vinculado a las TIC, desde diferentes ámbitos, y con diferentes responsabilidades. La primera experiencia del autor al respecto de las

TIC, y tras unos años vinculado a la logística y la gestión de la Calidad, tiene lugar como consultor de sistemas Enterprise Resource Planning (ERP) en dos empresas de consultoría. En las áreas de fabricación, logística y gestión comercial, y en tres diferentes sistemas ERP (BaanERP, Axapta, SAP), el autor se inicia en el conocimiento y despliegue de estos sistemas de gestión empresarial en diferentes empresas de diferentes sectores productivos.

Durante 5 años, del año 2001 a 2006, el autor toma la responsabilidad de Director de Organización y Sistemas en una empresa textil de tamaño Mediano, directamente reportando al Director General. En esta etapa, una de las responsabilidades definidas es la de director interno de proyecto de implementación del sistema ERP Axapta. Toda la infraestructura de Redes y Comunicaciones de la empresa queda asimismo bajo la dirección y coordinación del autor.

En 2006 y hasta 2108 el autor forma parte de la empresa multinacional Microsoft Corp., con sede en Redmond, desarrollando diferentes roles y responsabilidades, todos ellos relacionados de nuevo con las TIC. La mayor parte de esta etapa, de 2007 a 2018, el autor actúa como *Technical Service Coordinator* y como *Services Account Manager*, ambos roles vinculados a la responsabilidad de gestión de los *Partners* de Microsoft cuyo negocio principal se desarrolla en torno a los sistemas ERP y CRM. Durante la última parte de esta etapa, la gestión de esta responsabilidad de relación de *partnership* vira hacia un entorno muy polarizado por las tecnologías *Cloud* en la "nube".

Durante estos años vinculado a la gestión de empresas relacionadas con las TIC, tanto implantadoras (las de consultoría o el mismo Microsoft Corp. como fabricante de soluciones tecnológicas) y empresas demandantes (empresas "cliente" que piden que se les desplieguen estas soluciones), el mayor volumen de trabajo ha estado enfocado hacia los ERPs primero, y hacia CRM en segundo lugar.

Muchas de las líneas de trabajo vinculadas al mundo de los ERP y CRM cuentan con una característica muy relevante de este sector: la verticalización o especialización de las soluciones tecnológicas. Quiere esto decir que, pese a tratarse los sistemas ERP y CRM de entornos mayormente estándar, cada vez más los fabricantes de soluciones han ido adaptando su oferta a los requerimientos de los clientes que piden soluciones paquetizadas y adaptadas a sus necesidades y características específicas sectoriales. Esto ha hecho que en el mercado en general, y más en concreto en el mercado español, visto desde dentro de una empresa internacional como Microsoft con cobertura en la mayor parte de los sectores productivos, exista una clara imagen sobre qué sectores gozan de un mayor avance en los procesos de transformación digital, y cuales están un poco por detrás. De igual modo, y consecuentemente, el autor ha podido constatar qué sectores tienen mayor facilidad o dificultad en la adopción de ciertas tecnologías, lo cual le ha ayudado a identificar el sector de producción y distribución de vinos como uno de aquellos sobre los que pudiera tener un mayor impacto un estudio empírico sobre el impacto del uso de las TIC.

CRM ha sido una de las tecnologías que, durante los más de veinte años de responsabilidades del autor en diferentes ámbitos, ha costado más de despegar en cuanto a velocidad de expansión en el mercado, pero que con la irrupción de las plataformas en la "nube" ha desatado un mayor y más desenfrenado crecimiento. Esta circunstancia, junto con la selección del sector de la producción y distribución de vinos, y en colaboración con agentes relevantes del mundo universitario y del mundo de la consultoría verticalizada en el mundo de los vinos, ha llevado a

la realización de este trabajo, donde se analiza la necesidad y/o suficiencia de ciertas condiciones de uso de CRM y de las estrategias de Innovación para llevar a un buen desempeño organizacional de las empresas.

Además de la realización de este trabajo, y durante el periodo de ejecución del mismo, el autor ha participado y expuesto en varios Congresos con temáticas íntimamente relacionadas con el mismo:

- "Benefits of the use of CRM technological solution based on its degree of introduction within the companies" en el *II Congreso Internacional Online sobre Economía, Empresa y Sociedad*, en 2019.
- "Research model for measuring the impact of Customer Relationship Management (CRM) on performance indicators" en el *11th Innovation, Entrepreneurship and Knowledge Academy Conference (ACIEK),* en 2020.
- "Study on the determining keys for the use of the CRM technological solution in the wine production sector (wineries) in Spain" en el *II Congreso Internacional Online sobre Tecnología e Ingeniería: Procesos y Productos,* en 2020.

2.- Objetivos

La presente tesis doctoral tiene como objetivo general identificar el vínculo entre el uso de CRM y la mejora en el desempeño organizacional de las empresas, en interacción con las estrategias empresariales de innovación, y validado mediante un estudio empírico desarrollado en las empresas del sector de producción y distribución de vino en España.

Como objetivos concretos, este trabajo cuenta con:

1. Analizar cuál es la relevancia de CRM como herramienta tecnológica de gestión empresarial dentro del ámbito de la investigación científica
2. Detectar cuales son los focos de investigación (autores, editoriales, entidades y países) más productivos y cuales los más influyentes en el ámbito de CRM.
3. Estudiar con detenimiento las conclusiones obtenidas en los artículos más influyentes (con mayor número de citas) publicados en torno a la temática de CRM
4. Identificar cuáles pueden ser los beneficios esperados del uso de CRM en las PYMES, en relación con los sectores y mercados en los que se han realizado estudios previos relevantes.
5. Comprobar que CRM se puede posicionar dentro de las herramientas enfocadas a la consecución de objetivos de desarrollo sostenible, mediante un mapa de beneficios sostenibles en el tiempo (tanto los beneficios actuales de explotación, como a futuro a través de procesos de innovación y mejora continua).
6. Identificar las variables más relevantes y determinantes en la consecución de mejoras en el desempeño organizacional pretendido mediante el uso de CRM.
7. Crear un modelo de investigación que permita identificar los constructos y elementos claves en la consecución de un buen desempeño organizacional a partir del uso de tecnologías CRM, de la adopción de estrategias culturales relacionadas con CRM, de la implementación de procesos de innovación en productos, y de la propia innovación en procesos

8. Comprobar la validez del modelo de investigación a través de un estudio empírico desarrollado en un sector representativo de la economía productiva nacional, y que ayude a las empresas del sector a tomar sus decisiones sobre la idoneidad de CRM como herramienta clave de gestión empresarial.

9. Identificar cuáles son las condiciones que están vinculadas de forma necesaria y/o suficiente con la consecución de un buen desempeño organizacional a través del uso de CRM y de la adopción de estrategias de innovación, y hacer un estudio empírico en el sector elegido para comprobar efectivamente cuales son y cual es su consistencia y cobertura.

A estos puntos se da respuesta en el durante la realización de la investigación correspondiente a la presente tesis doctoral.

3.- Metodología

Este trabajo de investigación, en su conjunto, ha seguido escrupulosamente los pasos de toda investigación científica, tratando así de gozar del reconocimiento de su validez por todos aquellos agentes a los que este estudio les pueda servir, tanto en el desarrollo de su actividad investigadora, como en su actividad de toma de decisiones en el entorno empresarial.

Según Gómez (2006), investigar científicamente requiere conocer los conceptos centrales del área del saber en que se investiga, así como los procesos que la comunidad científica en general utiliza para generar nuevos conocimientos aceptados como válidos. En este caso, este trabajo parte de la experiencia y los conocimientos previos del autor referentes a la tecnología sobre la que gira el estudio, tras más de 20 años vinculado en su actividad profesional a este campo. También como punto de partida, y de nuevo debido a su experiencia profesional previa, cuenta el autor con un acceso notable a recursos clave para la realización de la validación empírica del modelo de investigación, en concreto personas relevantes e influyentes tanto en el ámbito de la tecnología, como en el ámbito del sector empresarial elegido para la validación. Este acceso a estos recursos tan relevantes garantiza que se ha puesto el máximo empeño en obtener la respuesta y la información más fiable y representativa posible para el estudio.

Sampieri et al. (2004) define dos enfoques en la investigación, el cuantitativo y el cualitativo. Ambos enfoques utilizan cinco fases:

1. Observación y evaluación de fenómenos
2. Establecimiento de suposiciones o ideas tras la observación y evaluación realizadas
3. Comprobación del grado en el que las suposiciones o ideas están bien fundadas.
4. Revisión de dichas suposiciones o ideas en base a las pruebas o análisis realizados.
5. Proponer nuevas observaciones y evaluaciones para esclarecer, modificar, cimentar y fundamentar estas suposiciones e ideas (u otras).

Como **primera fase**, y siguiendo este esquema de trabajo, en el presente estudio ha comenzado con la revisión del área de trabajo en la que se desarrolla el mismo. Para ello se ha identificado, revisado, y leído con atención, toda la literatura referente al uso de los sistemas CRM que se ha publicado desde los inicios conocidos de esta tecnología. Esta revisión de literatura se ha afrontado desde dos puntos de vista:

1. Cuantitativo: mediante la realización de un estudio bibliométrico en el que se han identificado los artículos científicos más relevantes e influyentes, así como los autores, entidades, y países más productivos y/o influyentes en esta área de investigación científica.
2. Cualitativo: mediante una revisión profunda de literatura, con el fin de categorizar las dimensiones más relevantes que identifican a los sistemas CRM como tecnología de gestión empresarial puntera y en expansión.

En una **segunda fase**, tras la identificación inicial de los elementos más relevantes que constituyen el estado de arte del presente trabajo, se ha planteado la suposición básica que identifica este estudio, que es el vínculo entre el uso de los sistemas CRM y la obtención de mejoras en el desempeño organizacional, a través de la participación de las estrategias de innovación. Esta es la línea argumental que define el trabajo en su conjunto, y que justifica el esfuerzo investigador del mismo.

La **tercera fase** se ha plasmado en la construcción de un modelo de investigación, y en su validación empírica en un sector concreto productivo. Estas dos etapas de investigación han pretendido cumplir el objetivo de comprobar del grado en el que las suposiciones hechas están bien fundadas. Este modelo se ha construido en base a los conocimientos adquiridos en la observación inicial de los estudios previos, así como de la realidad de la temática en estudio. Tal y como se planteaba en la fase anterior, el modelo se ha construido a través de tres componentes básicos:

- Uso de tecnologías CRM
- Uso de estrategias de Innovación
- Obtención de mejoras en el desempeño organizacional

El modelo de investigación construido a tal efecto, cuyo proceso de desarrollo se detalla en el capítulo 5 (artículo 4) es el siguiente:
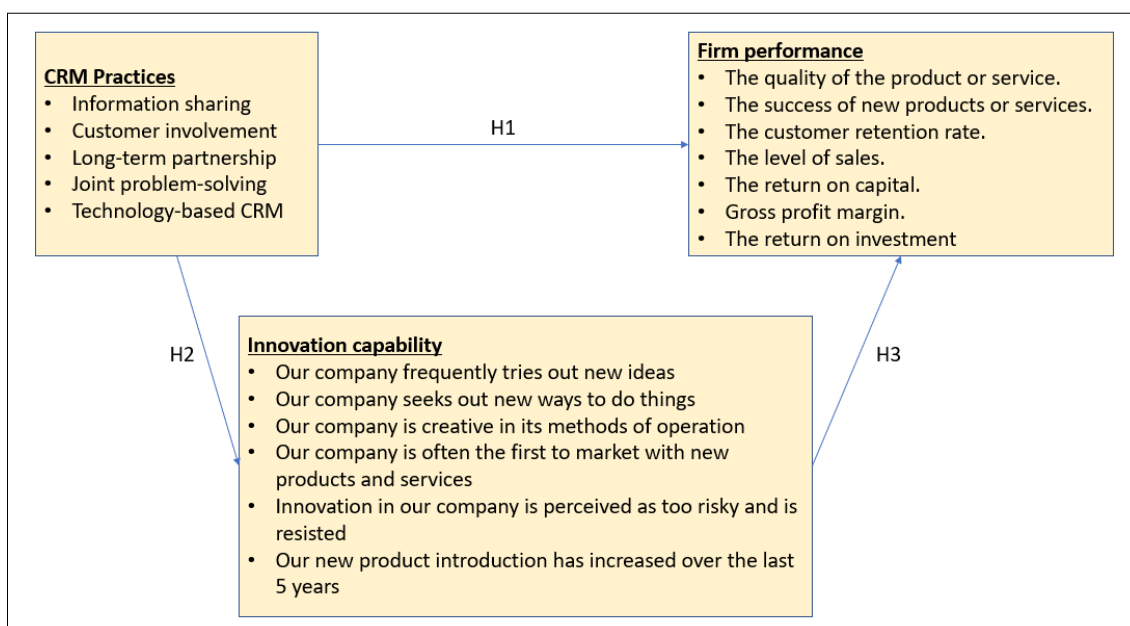

Figura 1. Modelo de Investigación propuesto. Fuente: elaboración propia.

Este modelo incluye tres variables principales (el grado de uso de CRM, la capacidad de innovación, y el desempeño organizacional), con sus correspondientes constructos y elementos que componen cada uno de ellos. También incluye tres hipótesis de trabajo que relacionan entre sí las tres variables.

La **cuarta fase** es la de la validación empírica, de revisión de dichas suposiciones o ideas en base a las pruebas o análisis realizados. La comprobación y validación empírica del modelo se ha realizado mediante un cuestionario que se ha hecho llegar a las empresas que cumplían los criterios definidos en la investigación durante el periodo de realización de la misma. Dichos criterios se han elegido, en base al conocimiento previo del sector vitivinícola, con la pretensión de que la muestra de empresas fuera altamente representativa de la realidad de dicho sector. Con las respuestas obtenidas, y comprobada la representatividad de las mismas, se han obtenido las conclusiones pertinentes a través de su análisis mediante la metodología conocida como "fuzzy-set qualitative comparative analysis (**fsQCA**)" o "**análisis comparativo cualitativo de conjunto difuso**".

Aprovechando que el modelo de investigación se ha construido para ser de aplicabilidad general, y dado que el sector en estudio cuenta con relativamente pocas empresas que cumplen los requisitos muestrales, se ha optado por esta metodología **fsQCA** de reconocida valía en este tipo de entorno. Para ello se han adaptado los constructos, agrupando sus elementos atendiendo a criterios lógicos y funcionales (como se detalla en el capítulo 6, con el artículo5), y cambiando el planteamiento de las tres hipótesis de partida por la validación de las condiciones de necesidad y suficiencia.

La **quinta fase**, enfocada a proponer nuevas líneas de investigación en base a los resultados y conclusiones obtenidos, está referida en las propias conclusiones de la fase anterior. De la obtención de resultados, y el análisis de los mismos, se obtienen tanto las conclusiones del estudio (de inmediata aplicación al entorno tanto académico como empresarial), como las propuestas de realización de análisis de casos de éxito de las empresas cuyos resultados han sido mejores, con el fin de profundizar en las razones y factores que pueden hacer de CRM una tecnología de gestión empresarial clave para las empresas de este sector.

En cuanto a la metodología utilizada en la validación empírica (**fsQCA**), en el estudio que nos ocupa, se ha seguido el enfoque **cualitativo**. Según Sampieri et al. (2004), los dos modelos de investigación (cuantitativo y cualitativo) se caracterizan por:

- "El enfoque cuantitativo utiliza la recolección y el análisis de datos para contestar preguntas de investigación y probar hipótesis establecidas previamente, y confía en la medición numérica, el conteo y frecuentemente en el uso de la estadística para establecer con exactitud patrones de comportamiento en una población".
- "El enfoque cualitativo**,** por lo común, se utiliza primero para descubrir y refinar preguntas de investigación. A veces, pero no necesariamente, se prueban hipótesis. Con frecuencia se basa en métodos de recolección de datos sin medición numérica, como las descripciones y las observaciones. Por lo regular, las preguntas e hipótesis surgen como parte del proceso de investigación y éste es flexible, y se mueve entre los eventos y su interpretación, entre las respuestas y el desarrollo de la teoría. Su propósito consiste en reconstruir la realidad, tal y como la observan los actores de un sistema social previamente definido".

Esta metodología de validación empírica (fsQCA) se utiliza para analizar el efecto combinado de las variables en un resultado. fsQCA se ha aplicado a diferentes campos de investigación como la innovación, la competitividad regional o las relaciones universidad-empresa (Álvarez-Coque et al., 2017; Nieto Alemán et al., 21018; García-Alvarez-Coque et al., 2020; Berné -Martínez et al., 2020). fsQCA se basa en la identificación de las condiciones necesarias y/o suficientes para que ocurra un evento. Una condición es *suficiente* cuando su mera presencia sirve para provocar el resultado en estudio, sin necesidad de ninguna otra condición. Si existe alguna combinación de condiciones que pueda explicar la existencia de un mismo resultado, este fenómeno se denomina multicausalidad (Ragin, 2009). Por otro lado, una condición es *necesaria* si esta condición está presente siempre que se produce el resultado. En estos términos, la metodología FsQCA identifica todas las combinaciones de condiciones que provocan un mismo resultado (Roig-Tierno, 2017). Se ha optado por la metodología QCA porque ofrece la posibilidad de analizar cualitativamente cuáles son los ingredientes y caminos que pueden llevar a que estas condiciones auguren un buen resultado.

4.- Estructura del trabajo de investigación

La presente tesis doctoral se presenta en forma de compendio de artículos, constituyendo en su conjunto un estudio completo que da respuesta a los objetivos planteados. Este estudio se presenta dividido en capítulos que, de forma coherente y complementaria, reflejan las diferentes etapas seguidas durante el proceso de investigación. A su vez, cada uno de los artículos que componen esta tesis puede ser leído y estudiado de forma autónoma, pues todos y cada uno de ellos tienen los elementos necesarios (marco conceptual, descripción metodológica, resultados, conclusiones y bibliografía) para ser considerados como investigaciones completas y concluyentes.

La tesis doctoral empieza con una introducción en la cual se presenta, de modo resumido y conciso: cual es el marco conceptual en el cual se ha desarrollado el trabajo de investigación, los antecedentes que justifican y originan el interés por desarrollar este trabajo, así como los objetivos que se pretenden alcanzar, la metodología seguida para conseguirlo, junto con el modo en que se ha estructurado el trabajo a través de una línea argumental lógica y consecuente con los objetivos perseguidos, y finalmente la bibliografía usada en el desarrollo de dicho capítulo introductorio. Con todo ello el trabajo queda contextualizado y presentado de forma concisa y coherente.

De entre los capítulos de la tesis, los 5 centrales corresponden a cada uno de los 5 artículos que constituyen el núcleo de la misma, y que son el fruto de la investigación desarrollada. Previamente a estos 5 capítulos se expone la introducción, y a continuación de ellos se presentan las conclusiones obtenidas de estos artículos en particular y de la investigación global en general.

La secuencia en la que se han presentado estos artículos es la misma en la que se han desarrollado las etapas de investigación (no siempre coincidente con el orden de publicación de los mismos, debido a los diferentes procesos de revisión, aceptación, y publicación en cada una de las revistas): un primer análisis del estado del arte sobre las investigaciones referentes a ñlaa solución tecnológica CRM, tanto desde el punto de vista cuantitativo (bibliométrico) como cualitativo (revisión de literatura), seguido por un primer estudio de los beneficios esperados

del uso de CRM, y por la creación de un modelo de investigación que demuestre si efectivamente estos beneficios se dan en la realidad. El paso final ha sido, en base al modelo de investigación creado, comprobar de forma empírica las condiciones que hacen efectivo y viable el impacto del uso de la herramienta CRM en un sector productivo altamente representativo (en este caso el de la producción y distribución de vinos en España).

La estructura de la tesis, en base a lo expuesto anteriormente, es la siguiente:

- Capítulo 1 - Introducción.
- Capítulo 2 - Artículo 1: "Customer relationship management (CRM): a bibliometric analysis".
- Capítulo 3 - Artículo 2 : "Customer relationship management and its impact on Innovation: A literature review".
- Capítulo 4 - Artículo 3 : "Customer relationship management: digital transformation and sustainable business model innovation".
- Capítulo 5 - Artículo 4 : "Research model for measuring the impact of Customer Relationship Management (CRM) on performance indicators".
- Capítulo 6 - Artículo 5 : "Customer relationship management (CRM) and Innovation: A qualitative comparative analysis (QCA) in the search for improvements on the firm performance in winery sector".
- Capítulo 7 – Conclusiones.
- Capítulo 8 - Bibliografía.

Cada capítulo contiene un pequeño resumen del artículo que contiene, de modo introductorio y para una fácil comprensión del objetivo y desarrollo de cada uno de ellos. También se incluyen los detalles de las revistas científicas ("*Journals*") en las que se ha publicado cada uno de ellos, y que muestran la relevancia del estudio realizado en cada caso.

En el capítulo 2, se incluye pues el primer artículo de la tesis, en el que se desarrolla un estudio bibliométrico completo de las publicaciones de CRM más recientes. El objetivo de este artículo es identificar cuales son los focos más relevantes en cuanto a producción (número de publicaciones) e influencia (número de citas) de estudios científicos publicados en las revistas de mayor impacto. Como resultado de esta investigación salen a la luz los autores, entidades y países más productivos, así como los más influyentes (no necesariamente coincidentes los más productivos y los más influyentes) en esta área de investigación, así como los artículos más influyentes (con más citas, y que por tanto más interés han suscitado en los investigadores que los han leído).

Junto con el capítulo 2, el capítulo 3 conforma el estado del arte o marco conceptual completo sobre el que se desarrolla toda la tesis doctoral, y el estudio global en su totalidad. Este capítulo 3 contiene la realización de una revisión de literatura completa de los artículos publicados sobre CRM e innovación en los últimos años. Se incluye en esta revisión, junto con la variable principal "CRM", la variable "innovación", por el interés que suscita en el afán de la investigación por demostrar que los sistemas CRM pueden catalogarse dentro de las herramientas "sostenibles", cuyos beneficios sean sostenibles en el tiempo, para lo cual se suele asumir como necesaria la participación de la innovación.

Con los resultados y conclusiones obtenidos conjuntamente con los capítulos 2 y 3, se da respuesta a los 3 primeros objetivos del presente trabajo de investigación. Los artículos

analizados, junto con las conclusiones obtenidas, dan fe de la relevancia de CRM tanto como objeto de investigación, así como de herramienta puntera de gestión. Además, estos artículos definen el terreno de juego sobre el que cualquier investigación sobre CRM debe desarrollarse, identificando cuales son los focos de influencia, así como las líneas de investigación más interesantes a llevar a cabo sobre CRM e innovación, en busca de mejoras de desempeño organizacional en las PYMES.

Una vez establecido el marco conceptual de la investigación, en el capítulo 4 se plantea un mapa de beneficios esperados del uso de CRM. Visto en la etapa anterior que es clave la importancia de tener una visión sostenible en el tiempo, este mapa de beneficios esperados del uso de CRM se divide en la visión de explotación actual de la gestión del conocimiento del cliente, y en la visión de futuro por los beneficios que la innovación puede traer en próximas etapas. Se da respuesta en este capítulo a la búsqueda de los objetivos 4 y 5, identificando no solo los beneficios esperados en términos de mejoras de desempeño organizacional, sino que también (y de forma clave para este trabajo en general) identificando las variables críticas para cualquier modelo de investigación que pretenda demostrar la validez de dichos beneficios esperados.

El objetivo 7 del presente trabajo obtiene respuesta en el capítulo 5, en el cual se genera un modelo de investigación completo que relaciona conjuntamente el uso de los sistemas CRM y el despliegue de estrategias de innovación, con la obtención de mejoras en el desempeño organizacional. Basándose en todas las conclusiones obtenidas en los capítulos anteriores, y en los estudios previos de otros autores, se crean los constructos e hipótesis correspondientes, y se asignan los elementos que son claves en el modelo.

Dado que el objetivo principal de este trabajo es eminentemente práctico, y que pretende aportar conclusiones aplicadas y aplicables a empresas cuya toma de decisiones respecto al despliegue de soluciones CRM pueda estar en duda, en el capítulo 6 se ha desarrollado un estudio empírico que da respuesta a los objetivos 8 y 9. En concreto se ha elegido un sector altamente representativo de la economía española, y se ha llevado a cabo un trabajo de campo con las empresas más representativas del mismo, analizando sus condiciones más significativas en su búsqueda de caminos que lleven al mejor desempeño organizacional, y con él a la mejora de los resultados empresariales.

En la Tabla 1 se resumen los vínculos a los que se acaba de hacer referencia entre los objetivos planteados y los capítulos desarrollados durante el trabajo de investigación.

Objetivo	Capítulo
• Analizar cuál es la relevancia de CRM como herramienta tecnológica de gestión empresarial dentro del ámbito de la investigación científica	Capítulo 2 - Artículo 1: "Customer relationship management (CRM): a bibliometric analysis". Capítulo 3 - Artículo 2 : "Customer relationship management and its impact on Innovation: A literature review".
• Detectar cuales son los focos de investigación (autores, editoriales, entidades y países) más productivos y cuales los más influyentes en el ámbito de CRM.	
• Estudiar con detenimiento las conclusiones obtenidas en los artículos más influyentes (con mayor número de citas) publicados en torno a la temática de CRM	

• Identificar cuáles pueden ser los beneficios esperados del uso de CRM en las PYMES, en relación con los sectores y mercados en los que se han realizado estudios previos relevantes.	Capítulo 4 - Artículo 3 : "Customer relationship management: digital transformation and sustainable business model innovation".
• Comprobar que CRM se puede posicionar dentro de las herramientas enfocadas a la consecución de objetivos de desarrollo sostenible, mediante un mapa de beneficios sostenibles en el tiempo (tanto los beneficios actuales de explotación, como a futuro a través de procesos de innovación y mejora continua).	
• Identificar las variables más relevantes y determinantes en la consecución de mejoras en el desempeño organizacional pretendido mediante el uso de CRM.	
• Crear un modelo de investigación que permita identificar los constructos y elementos claves en la consecución de un buen desempeño organizacional a partir del uso de tecnologías CRM, de la adopción de estrategias culturales relacionadas con CRM, de la implementación de procesos de innovación en productos, y de la propia innovación en procesos	Capítulo 5 - Artículo 4 : "Research model for measuring the impact of Customer Relationship Management (CRM) on performance indicators".
• Comprobar la validez del modelo de investigación a través de un estudio empírico desarrollado en un sector representativo de la economía productiva nacional, y que ayude a las empresas del sector a tomar sus decisiones sobre la idoneidad de CRM como herramienta clave de gestión empresarial.	Capítulo 6 - Artículo 5 : "Customer relationship management (CRM) and Innovation: A qualitative comparative analysis (QCA) in the search for improvements on the firm performance in winery sector".
• Identificar cuáles son las condiciones que están vinculadas de forma necesaria y/o suficiente con la consecución de un buen desempeño organizacional a través del uso de CRM y de la adopción de estrategias de innovación, y hacer un estudio empírico en el sector elegido para comprobar efectivamente cuales son y cual es su consistencia y cobertura.	

Tabla 1. Correspondencia entre los objetivos y los capítulos de la tesis doctoral. (Elaboración propia).

Con todo ello, y tal y como se había planteado dentro del objetivo global del trabajo de investigación y de la tesis doctoral, se ha conseguido justificar la relevancia del estudio de CRM como moderna solución tecnológica de gestión con elevando impacto en la consecución de mejoras en el desempeño organizacional, así como la validación de dicha hipótesis de partida junto con las condiciones de aplicabilidad a un sector concreto y altamente representativo de la economía española como es el de la producción y distribución de vinos.

De este trabajo se deriva a su vez la identificación de futuras líneas de investigación, como puede ser tanto la inclusión de otras variables representativas en el modelo y en el estudio empírico (en concreto la "gestión del conocimiento del cliente", con sus correspondientes elementos),

como la aplicabilidad y posible comprobación empírica de estas mismas hipótesis a otros sectores productivos cuyas dudas sobre los beneficios de uso de sistemas CRM puedan disuadir a los tomadores de decisiones sobre su idoneidad como solución clave de gestión empresarial.

Capítulo 2 : Customer relationship management (CRM): a bibliometric analysis

Resumen del Artículo 1: "Customer relationship management (CRM): a bibliometric analysis".

El objetivo de este artículo es analizar, desde el punto de vista bibliométrico, la relevancia de los sistemas CRM como una de las soluciones tecnológicas de gestión empresarial con mayor crecimiento en las últimas dos décadas. El enfoque del artículo es pues el de un análisis cuantitativo de CRM como objetivo de estudio científico.

La principal aportación de este trabajo ha sido el utilizar las herramientas bibliométricas modernas con el fin de mostrar cómo la influencia del CRM ha ido aumentando durante las últimas décadas, siendo este estudio apoyado por los diferentes indicadores modernos que habitualmente se están considerando en los estudios científicos. Esta creciente influencia declarada de CRM durante las últimas décadas es el pilar para futuras inversiones en investigación sobre cómo el mercado está percibiendo el valor de CRM y qué beneficios está aportando esta tecnología a las empresas modernas, dinámicas y exitosas en la actualidad.

Los resultados concretos e individualizados de este estudio versan alrededor de la identificación de los autores, instituciones y países más influyentes en este ámbito de investigación, y que por tanto deberían ser el principal ámbito de estudio para nuevas y futuras investigaciones en este campo. Del mismo modo, la identificación de los artículos más influyentes constituye la base para cualquier estudio posterior, ya que de su lectura y análisis derivará la identificación de posteriores líneas de investigación.

Tras el estudio, podemos concluir que las Revistas más influyentes en el campo de CRM son claramente " EXPERT SYSTEMS WITH APPLICATIONS" y "JOURNAL OF MARKETING", evaluados por las diferentes variables consideradas en este estudio, considerando principalmente el índice "h" y el número de artículos con más de 100 citas. El desafío más grande para este estudio ha sido el bajo número de revistas que han publicado sobre CRM hasta el momento del estudio, si bien y por el contrario esto ha permitido una investigación más selectiva, centrándose en las publicaciones de mayor calidad.

Respecto al número de publicaciones, el estudio muestra un claro despegue de CRM como tema relevante de investigación a partir del año 2.000, desde el cual tanto el número de publicaciones como el número de citas ha estado creciendo con progresión lineal prácticamente en todos los años hasta la actualidad (solo entre 2011 y 2014 se rompe esta tendencia creciente).

El número de citas muestra la juventud de esta tecnología como tema de estudio, ya que solo el 20% de las publicaciones han sido citadas más de 50 veces. A su vez, y como punto a favor, esto le da a CRM unas expectativas claras de crecimiento como tema de interés y como solución tecnológica de gestión empresarial, aún en fase de imponente crecimiento y por tanto aún muy lejos todavía de su periodo de madurez y estancamiento.

Estados Unidos y Reino Unido son claramente los países más productivos e influyentes en la mayoría de los parámetros analizados. Los autores más productivos (con el mayor número de publicaciones) proceden de Estados Unidos, seguidos de Estados Unidos y Taiwán. En la misma línea, instituciones de todo el mundo han contribuido a la investigación de Customer Relationship Management durante el periodo de tiempo analizado, pero queda demostrado que la gran mayoría de ellas están establecidas en Estados Unidos: 25 instituciones de Estados

Unidos están entre las 50 más productivas e influyentes instituciones en la investigación de CRM a nivel mundial, exactamente la mitad de la cantidad total de instituciones que contribuyen al estudio de CRM, seguidas por Taiwán, Corea del Sur, Peoples R China, Holanda e Inglaterra (Reino Unido). Finalmente, si consideramos a los Países en sí, los indicadores absolutos vuelven a mostrar la posición destacada de Estados Unidos como el País con mayor número de publicaciones y citas, lejos del segundo (Reino Unido).

Las conclusiones obtenidas en este artículo permiten obtener una visión global del estado del arte en la investigación de Customer Relationship Management desde el punto de vista bibliométrico y cuantitativo. Los principales indicadores estudiados y analizados han sido el número de artículos publicados, la cantidad total de citas, el índice "h" y los artículos más citados en cada categoría, todos ellos indicadores clave para el análisis bibliométrico.

Las líneas de investigación futuras que se intuyen a partir de estos resultados y conclusiones señalan hacia la identificación de los beneficios más importantes que el uso de los tres módulos básicos de CRM (Ventas, Marketing y Servicios) puede proporcionar a las empresas después de implementar y utilizar eficazmente esta tecnología. Esta podría ser la base para establecer las claves para mostrar cuales son los factores críticos de éxito de las empresas directamente relacionados con el uso de soluciones CRM.

Se concluye de forma general que el creciente interés por el estudio de CRM es la demostración de cómo la búsqueda de modelos de gestión empresarial sostenible puede basarse en el uso intensivo y eficiente de CRM como solución tecnológica clave para un negocio eficaz y exitoso. Haber determinado qué autores, entidades y países son más influyentes en este campo de estudio, así como haber identificado los artículos más influyentes, ha sido la base para iniciar las siguientes iniciativas de investigación en este campo.

Datos de publicación del Artículo 1: "Customer relationship management (CRM): a bibliometric analysis".

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La revista IJSOI está indexada, en el índice SCImago Journal and Country Rank, conocido como SJR, en el cuarto cuartil de este índice internacional, con un índice de citas de 0.4 en 2019.

Siendo este el primer artículo dentro del trabajo de investigación, contiene las bases para el desarrollo de todo este trabajo, como son la justificación de la elección de CRM como herramienta clave de gestión empresarial, así como la identificación de los focos más productivos y/o influyentes en esta área de investigación. Partiendo de los elementos más relevantes identificados, los siguientes artículos profundizan en la tarea de investigación para ampliar el conocimiento sobre los sistemas CRM, de modo que finalmente se pueda crear y validar empíricamente un modelo de investigación que relacione el uso de CRM con las mejoras en el desempeño organizacional.

Artículo 1: "Customer relationship management (CRM): a bibliometric analysis".

Customer Relationship Management (CRM): A Bibliometric Analysis

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Customer Relationship Management; CRM; Business Intelligence; Marketing; Customer Service; Services; Sales Force Automation.

Abstract

This is a bibliometric study of the publications about Customer Relationship Management (CRM), as one of the nowadays most implemented and extended Enterprise Management Software. The objective of this paper is twofold: on the one hand to analyze the impact and focus of influence of the different authors and entities that have been researching on CRM, and secondly to determine (based on the results of the bibliometric study of the publications on CRM) if it may be of interest to investigate and deepen the benefits and impact on CRM results as a modern and leading enterprise management solution.

Bibliometrics is a fundamental field of information science that studies bibliographic material quantitatively. This study presents a o bibliometric overview of CRM research using the Web of Science database, identifying the most prolific and influential journals, authors, institutions and countries, considering the period since 1900 to 2017. A database with 1.685 results has been analyzed, showing as main results that Expert Systems with Applications is the most prolific Source title or journal in the field, Verhoef P.C. from Groningen University is the most cited author and Van den Poel D. from Ghent University is the most prolific author with 31 published papers. Ghent University is the most productive institution with the highest number of published papers, and University of Maryland College Park has published the most cited papers. It also shows that USA is definitely the most influential Country with the highest number of published papers (the second one is UK with nearly the third of publications) and with the highest number of citations (again, the second one is UK with the fifth part of citations that USA). Specially interesting the rank of Spain, where the investigation is taking place, with the eight rank on published papers and the twelfth rank on paper citations.

Based on the results, we can conclude that, effectively and as it was assumed, CRM is a booming and very interesting solution as a trending topic to continue researching in subsequent papers.

Introduction

This document is a workout studying the influence that Customer Relationship Management (CRM) is having among the modern business world. This technology is one of the modernist components of the Business Intelligence suite (Dumas et al., 2018), specifically focused on the customer (external) information (Negash and Gray, 2008). The main objective of this paper will therefore be to review the literature on previous bibliometric studies, and in case of not finding any modern study of a complete scope on CRM, develop a bibliometric study on CRM that allows to know the most influential sources of information and research on technology, and identify the most influential papers for further studies on the value and applicability of the benefits of using CRM in modern companies.

CRM was initially considered a key tool for managing and optimizing the sales force automation. Since the 1970s where it was firstly launched into the market (Buttle, 2004), CRM has been experienced a process of adaptation to the modern business needs, mostly in a very changing and dynamic world where changing needs makes more and more critical the use of a customizable tool. Nowadays, one of the most challenging hits for a successful enterprise is to convert the collected data into actionable information, and here CRM becomes a key technical solution as a valuable tool for identifying, extracting and transforming data into it. This is how enterprises demand and receive more return from their investments, especially with applications such as sales-force automation, service automation, and marketing automation.

Seeing the market value and specifications for CRM and matching them with the most valuable features for successful firms in the modern competitive market, this paper plans to state the influence and value of this CRM technology through a bibliometric study of the published papers about its content, value, benefits, and influence. This paper plans to review firstly the literature about the solution CRM, and secondly about bibliometrics (the science that will help us understand which the most valuable focus of research activity around CRM are).

After literature review, there is a description of the methodology for getting a clear picture of the volume and influence of published researches and studies. The raw tables for the publishing journals are presented in this study ranked per timely evolution, per number of citations, per prolific and influential authors, per productive and influential institutions, and finally per Country.

The conclusion has to be with the growing influence that CRM is having day after day, and with the core authors, core institutions, and core countries for CRM technology investigation efforts. The main outcome is then the global actual picture where CRM investment is being located, and the most influential papers and researchers that may help understand the market value of CRM.

These outcomes give rise to subsequent studies on CRM, to determine the impact of the use of this technology on business results and on the improvement of the supplier-customer relationship in a sustainable business management environment.

Literature Review

This paper follows the Bibliometric analysis methodology, a scientific methodology for studying and classifying bibliographic material quantitatively. Recent studies showed that bibliometrics can provide a lot of information regarding a research discipline. Nowadays it has become a very popular way to assess the state of the art of a scientific discipline, mostly with the actual easy access to scientific literature through the Internet (Allen et al., 2009). The objective of this study is to identify the most influential research and the main trends over time for the subject we are interested on, being for this a very useful tool bibliometrics as it provides a general picture of the research area in study.

Customer Relationship Management (CRM)

CRM was born in the 1970s, as a new tool for managing and optimizing the sales force automation inside the Enterprises (Buttle, 2004). CRM has arrived nowadays to be one of the most popular tools for Enterprise Information Management, not only for sales and marketing purposes by helping organizations manage customer interactions more effectively (King and Burgess, 2008) but also for knowledge management and for organizational behavior understanding. CRM was defined as a combination of processes, people and technology looking for the best understanding of a company's customers (Chen and Popovich, 2003). It is also the modern integration approach of relationship management when customer retention and relationship management is the main focus.

CRM has become a way to survive in a globalized market where enterprises need to gain competitive advantages, not only the leading-edge ones but also all the competitive targeted ones (Buttle, 2004). Customer Relationship Management is much more than a software to install, it is a real reinvention of the way we do business, the way we put the customer in the main and definite central point of all our view and efforts (Chen and Popovich, 2003; Guerola-Navarro et al., 2020). In this world were all the industrial and final customers expect to be cared and dealt as special and irreplaceable ones, the information got in the past about customers and relationships becomes critical and valuable from the beginning to the end. CRM has become a business necessity not only for High sized enterprises but also for the Small and Medium enterprises wanting to compete and survive in the twenty-first century. For these enterprises there is the clear need to become customer-centric focused and firmly decided to reach the targeted Customer Loyalty.

Customer loyalty is the most valued outcome of marketing from a relational perspective. Relationship marketing is the global marketing approach to offering more than a core product in order to satisfy the long-term value needs for the customers (Grönroos, 1997). Customer Relationship Management is a key tool for adopting a true relational marketing plan and for considering the customer is in a relational mode. Despite of the initial bad publicity that CRM had with high levels of failure during project implementations, Customer centric orientation makes really CRM a valued and needed technology that seems to be here to stay.

Bibliometrics

Regarding bibliometrics, there was provided a first definition focused on the use of this discipline in the 1980s, leaving the concept open for further development (Broadus, 1987). This initial concept has been modernly updated by (Bar-Ilan, 2008) from the general perspective of

informetric, having said that the Internet has potentized the scope of these studies. Bibliometric studies have evolved since then, incorporating new technologies as key tools to determine the influence of authors, institutions, countries, etc. in the field of scientific and research publications. In the most recent publications, the influence of the use of powerful computer tools for data analysis is observed, especially in terms of data processing capacity when large volumes of information are available (Deng and Lin, 2012; Yin, 2013; Cadez, 2013; James et al., 2015; Zyoud and Fuchs-Hanusch, 2017; Liang and Liu, 2018). In the current bibliometric studies on Big Data and Business Intelligence, we can clearly see the importance and increasing impact that these tools are having on the ability to process data in general, and as a focus of bibliometric study in particular (Liang and Liu, 2018; Vicedo et al., 2018; Gil et al., 2010).

Looking into the most popular topics for bibliometrics studies, there is still not a huge amount of publications about CRM, but this study shows how CRM interest has been significantly growing-up during last years all over the scientific world. CRM has been identified as one of the greatest technological contributions to enterprises in the 21st century (Chao et al., 2007). Despite of the impact of CRM in the modern management structures, there are still few studies based on bibliometrics analysis for CRM. It also studied the technology trends and forecasts of CRM from 1991 to 2005 (Chao et al., 2007). It was compared data mining and CRM trends using bibliometrics for years 1989 to 2009 by (Tsai, 2011). The present paper has the aim to extend the period of bibliometrics research until 2017, given that CRM is one of the most relevant technologies in modern era for increasing workforce productivity in the Information Age (Attaran et al., 2019).

Nevertheless, there are many sciences and research areas where Bibliometrics has been used since it was introduced in the 1980s. Seeing the influence areas of CRM as Management solution, is very interesting to evaluate how bibliometrics has been empowering the research studies about three directly related areas: Management, Economics, and Marketing. Economics has been one of the sciences where more attention has been put on by bibliometric analysis from multiple perspectives. The influence of economic journals was studied by several researchers (Autor, 2012; Card and DellaVigna, 2013; Kocher and Sutter, 2001; Laband, 2013; Laband and Piette, 1994; Stern, 2013; Sternberg and Litzenberger, 2005; Süssmuth et al., 2006), identifying the most influential journals, authors, and institutions. Marketing has been another focus area for these studies. Citation analysis was used for analyzing the influence of marketing journals (Baumgartner and Pieters, 2003), and a ranking between the publications in the major journals was stablished (Tellis et al., 1999). Some other studies have analyzed the influence of marketing scholars, institutions and countries (Chan et al., 2009; Chan et al., 2012a; Chan et al., 2012b; Stremersch and Verhoef, 2005). One of the many disciplines where bibliometrics has been used is the paper by Podsakoff et al. (2008) in Management; in this study the authors developed a method for identifying the most influential authors and institutions, through the number of publications and the citation analysis. Similar studies in management developed by other authors are available, including (Gomez-Mejia and Balkin, 1992; Kirkpatrick and Locke, 1992; Trieschmann et al., 2000).

Having said that CRM has not been one of the most popular subjects of bibliometrics study, this paper aims to place the most important centers of influence of CRM within recent scientific literature. These centers of influence, having reviewed previous bibliometric studies, should logically be considered among the authors, entities, journals, and most influential countries on this subject. The methodology used to detect these centers of influence as well as their relative

importance in the world of CRM publications are detailed below. Subsequently, they present the results of the bibliometric study carried out with the data on the publications from the beginning of the years until the end of 2017.

Methodology

The final objective of this paper is to study the impact of the publications of each author, entity, country, etc. for which a methodology that reviews and measures the productivity of each of them is used, mainly and as previously stated, through the number of publications, number of citations, and the h-index. This methodology is explained below, as well as the results obtained.

This article analyses the information got through considering total number of papers, total citations and the h-index (Merigó et al., 2015), including authors, institutions and countries in the study. There have been several approaches on how to classify the value of research (Podsakoff et al., 2008):

- The publication count has usually been considered as the best measure for establishing the productivity of an author, institution or country (Borokhovich et al., 1995), but it has many limitations because there is no fixed way to determine how to compare and differentiate the specific nature of each paper.
- The use of the impact factor provided by WoS has been criticized, despite of having been commonly accepted traditionally as relevant indicator. Nowadays, it is becoming more relevant to use a five-year impact factor, due to the easiness of manipulation of the impact factor by using a self-citation policy.
- The number of citations is the most common indicator for measuring the influence of a paper, author, institution or Country, despite of having also some limitations on measuring the relevance of this indicator.
- A highly accepted index is the *h*-index (Hirsch, 2005). This index combines publications and citations under same framework. An *h*-index of 50 for a set of papers means that at least 50 papers have received 50 citations or more. The combination of publications and citations seems to be really valuable information, but it has still some limitations.

The database that is going to be used is Web of Science (WoS), owned by Thomson & Reuters. WoS covers most of the known scientific disciplines with more than 50.000.000 papers in more than 15.000 journals. We assume that WoS refers only high-quality journals, with on time publication and review of papers, scientific criteria for reviewing process and a wide dissemination through the Internet and most used channels for scientific papers publication. Regarding authorship and institutions, one unit has been given to each author or institution that have contributed to the paper. Talking about authorship, this paper tries to identify the influence and productivity for each of them, being the publication count a reflect of the number of papers published for each author, it does not mind if the papers are single authored or not. This is the way to detect the authors with highest number of papers published, giving a general view of the total production of each author.

There is not a specific section in WoS for CRM, or even for Business Analytics, so there is the need for refine the results by filtering and considering and/or dismissing the results depending on the main focus of the journals and the papers included on them. The Database "Web of Science Core Collection" is the core one for this study, included in the Web of Science. Currently there is no category like "Data mining" or "Business analytics" that may be the most fitting ones for this study research, so there is the need for looking for the best categories and searching

areas to describe the study focus. Considering the subject in study, the interesting topics to select have been: "CRM" OR "Customer Relationship Management", that are the acronym and the complete name of the subject in study. Closing year 2017, the timespan for this study will be from 1900 to 2017, receiving a global amount of 10,038 results from Web of Science Core Collection related to these topics and timespan. The 2018 results will not be considered because there are still some of them being revised and for some months expected to be published, and that would made not consistent the static view of the global picture at the moment.

Considering the areas where Customer Relationship Management can be determinant main topic of study, further fine tuning has been to select the following refining **categories** in the left tree of Web of Science with a global amount of 3,543 results:

- BUSINESS (1,245),
- MANAGEMENT (1,022),
- COMPUTER SCIENCE INFORMATION SYSTEMS (1,020),
- OPERATIONS RESEARCH MANAGEMENT SCIENCE (576),
- COMPUTER SCIENCE THEORY METHODS (563),
- COMPUTER SCIENCE INTERDISCIPLINARY APPLICATIONS (547),
- ECONOMICS (338),
- INFORMATION SCIENCE LIBRARY SCIENCE (290),
- COMPUTER SCIENCE SOFTWARE ENGINEERING (248),
- BUSINESS FINANCE (150).

Another important field for refining has been to select the Document Types interesting for this research: ARTICLE (1,646), REVIEW (35), NOTE (0), LETTER (4). The Results shown in the final research have been a global amount of 1,686.

Results

This section presents the main results found in WoS concerning the publishing journals in CRM research, the evolution of published papers, the most cited papers, the most prolific authors, institutions and countries.

Publishing journals

The most influential Journals or Source Titles in the CRM field are clearly EXPERT SYSTEMS WITH APPLICATIONS and JOURNAL OF MARKETING, assessed by the different variables considered in this study, mainly considering the h-index and number of papers with more than 100 citations. The second group of influence is composed by INDUSTRIAL MARKETING MANAGEMENT, JOURNAL OF THE ACADEMY OF MARKETING SCIENCE, DECISION SUPPORT SYSTEMS, and JOURNAL OF BUSINESS RESEARCH, again considering the h-index and the total number of papers published by them and their citations. The rest of the Journals are ranked in this study according to their influence. There are four columns showing the number of papers with more than 100, 50, 25 and 10 citations, as the way for considering the influence of each paper published in these journals.

In Table 1 there are shown the results of this research. EXPERT SYSTEMS WITH APPLICATIONS and JOURNAL OF MARKETING have published the most cited papers in CRM, especially considering the JOURNAL OF MARKETING that has the highest number of citations (4.885)

despite of being the third one regarding published papers what makes for it the highest ratio of total citations per published paper (143,68). The Journal or Source Title with highest number of published papers is EXPERT SYSTEMS WITH APPLICATIONS with 88.

Table 1. The 20 most influential CRM research journals according to WoS

R	Name	h	TC	TP	TC/TP	>100	>50	>25	>10	IF	5-IF
1	EXPERT SYSTEMS WITH APPLICATIONS	32	3.094	88	35,16	6	17	42	69	3.768	3.711
2	JOURNAL OF MARKETING	29	4.885	34	143,68	16	23	30	32	7.338	9.592
3	INDUSTRIAL MARKETING MANAGEMENT	26	2.105	57	36,93	4	13	26	42	3.678	4.488
4	JOURNAL OF THE ACADEMY OF MARKETING SCIENCE	20	2.381	31	76,81	6	13	18	23	8.448	9.810
5	DECISION SUPPORT SYSTEMS	20	1.894	29	65,31	5	11	17	26	3.565	4.574
6	JOURNAL OF BUSINESS RESEARCH	19	1.446	33	43,82	4	10	14	25	2.509	3.689
7	MARKETING SCIENCE	16	1.004	20	50,20	2	8	16	17	2.794	3.918
8	JOURNAL OF MARKETING RESEARCH	15	1.516	21	72,19	3	9	12	16	3.854	5.678
9	INDUSTRIAL MANAGEMENT DATA SYSTEMS	14	776	33	23,52	1	5	8	16	2.948	2.724
10	MANAGEMENT SCIENCE	14	578	19	30,42	0	2	11	16	3.544	4.927
11	JOURNAL OF INTERACTIVE MARKETING	13	949	18	52,72	3	6	11	14	3.864	9.472
12	JOURNAL OF SERVICE RESEARCH	13	1.547	18	85,94	3	8	11	14	6.842	7.099
13	EUROPEAN JOURNAL OF MARKETING	11	569	19	29,95	2	2	6	12	1.497	2.545
14	JOURNAL OF BUSSINESS & INDUSTRIAL MARKETING	10	333	29	11,48	0	1	3	9	1.833	2.062
15	TOTAL QUALITY MANAGEMENT &	10	339	28	12,11	0	0	3	10	1.526	1.971

R	Name	h	TC	TP	TC/TP	>100	>50	>25	>10	IF	5-IF
	BUSINESS EXCELLENCE										
16	JOURNAL OF SERVICES MARKETING	10	313	20	15,65	0	1	3	10	2.408	2.817
17	SERVICE INDUSTRIES JOURNAL	7	171	17	10,06	0	0	2	5	1.258	1.686
18	LECTURE NOTES IN COMPUTER SCIENCE	6	192	37	5,19	0	1	1	4	0.402	-
19	AFRICAN JOURNAL OF BUSINESS MANAGEMENT	4	67	18	3,72	0	0	0	1	1.105	1.105
20	MARKETING AND CONSUMER BEHAVIOR: CONCEPTS, METHODOLOGIES, TOOLS, AND APPLICATION	0	0	23	0,00	0	0	0	0	-	-

Abbreviations: R = Rank; Name = Name of the Journal or Source Title; h = h-index; TC = Total Citations; TP = Total Papers; TC/TP = ratio total Citations per Published Paper; >100, >50, >25, >10 = number of papers with more than 100, 50, 25, 10 citations; IF = Impact Factor 2017; 5-IF = five-year Impact Factor 2017.

The second influence group considers INDUSTRIAL MARKETING MANAGEMENT, JOURNAL OF THE ACADEMY OF MARKETING SCIENCE, DECISION SUPPORT SYSTEMS, and JOURNAL OF BUSINESS RESEARCH, all of them with pretty higher number of citations than the next influence group, but far from the two first ones. INDUSTRIAL MARKETING MANAGEMENT has the second highest number of published papers (57) even higher than the JOURNAL OF MARKETING mentioned above in the first influence group of Journals. On other hand, the JOURNAL OF THE ACADEMY OF MARKETING SCIENCE has the second globally highest ratio of total citations per published paper (76,81). Important to say the four Journals included in this group, have higher ratio of total citations per published paper than the first ranked one EXPERT SYSTEMS WITH APPLICATIONS which has the highest number of published papers (88).

Evolution of published articles

As shown in Table 1, there are only 5 journals with at least 20 published papers about Customer Relationship Management, and only 7 Journals with more than 1.500 citations. That means that CRM has not a currently relevant position as research field in WoS.

Despite of not being a very common research field in WoS, Fig 1 shows that CRM is becoming an increasingly threated subject of research in the last decade. As it is shown in Fig 1, CRM started being studied in 1992 with only 1 testimonial article, and it was in year 2000 when it

started the takeoff with 9 papers. It has doubled in 2001 with 21 papers, and it was growing with lineally progression until the 133 papers in 2011. Then the .com enterprises entered in a crisis period that made this research topic lineally decrease of interest until the 86 papers in 2014. The three last columns, corresponding to the last three years, show the impact and the influence of this topic as high potential research topic for nowadays, with 174 papers in 2015, 164 papers in 2016, and 173 papers in 2017.
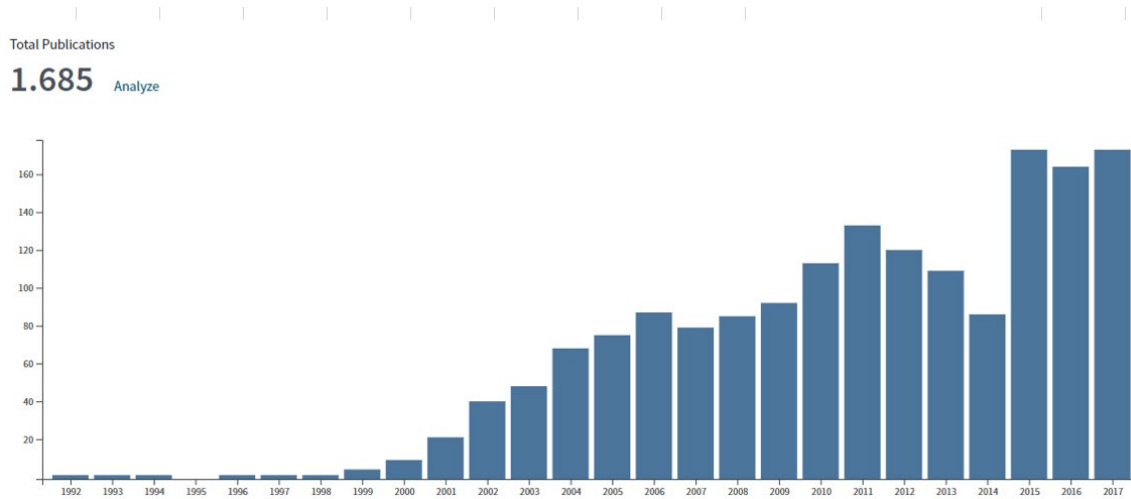
Fig 1. Number of annual publications in CRM in WoS (articles, letters, notes, and reviews) since 1900

On other hand, concerning number of citations, Fig 2 show how the papers on CRM started increasing the number of citations from the 1 citation in year 2000 until the 5.490 citations in 2017, again with a lineal progression that shows how the potential and influence of this research topic has become more and more important and relevant.
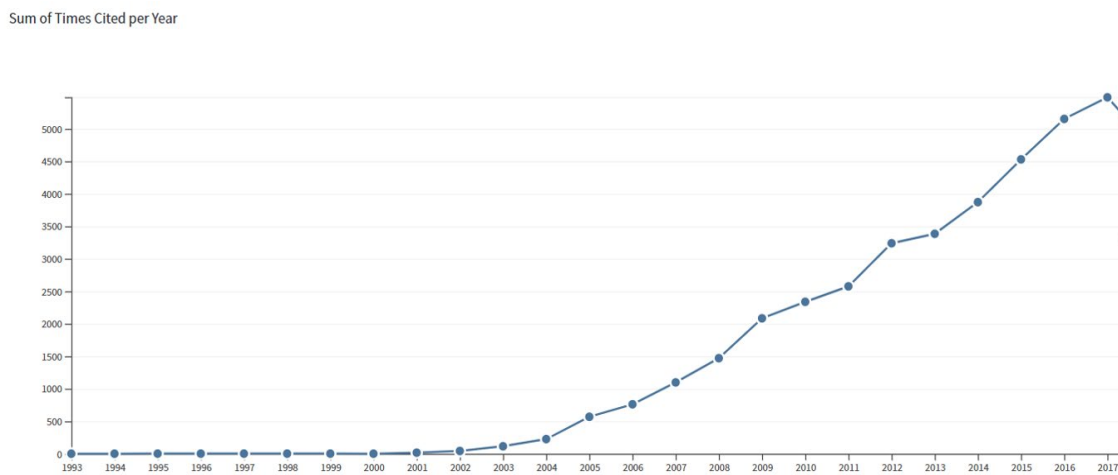
Fig 2. Number of annual citations in CRM in WoS (articles, letters, notes, and reviews) since 1900

Furthermore, if we look to the Table 2 the citation structure for the 1.685 considered papers, we can firstly see that the number of citations is very low compared to other disciplines where several papers receive more than 1.000 citations (Merigó et al., 2015). Other relevant conclusion is that it is worth studying only the period since year 2000 to 2017, as the research results are nearly the same that in all time period research. Furthermore, it is clear that most of the papers receive less than 50 citations (1.3334 papers that makes the 80% of the global studied 1.685 results).

Table 2. General citation structure in CRM research in WoS

Citations	All time		2000 – 2017	
	Number of papers	% Papers	Number of papers	% Papers
> 500 citations	4	0,237	4	0,239
> 200 citations	32	1,899	31	1,851
> 100 citations	88	5,223	86	5,134
> 50 citations	227	13,472	224	13,373
<= 50 citations	1.334	79,169	1330	79,403
Total	1.685	100,000	1675	100,000

The most influential articles in CRM research of all time

Over the last decade, more widely since year 2000, many influential papers have been published in CRM research. Table 4 shows a list with the 50 most cited papers in CRM of all time. Analyzing this table there is a clear view on which are the most influential papers in CRM research.

The Journal of Marketing has 13 papers in the list, being the journal with highest number of papers in the list. Next there are two journals with 4 papers each one in the list, namely Journal of the Academy of Marketing Science, and Decision Support Systems. With 3 papers in the list there are several journals or source types: Expert Systems with Applications, Industrial Marketing Management, Journal of Service Research, and MIS Quaterly.

The most cited paper of all time in CRM research in the list, was published in 2003 by Burnham, Frels, and Mahajan, with 592 citations currently. There are three other papers that have also received more than 500 citations: the second one was published by Reinartz, Krafft, and Hoyer in 2004, the third one by Payne and Frow in 2005, and the fourth one by Verhoef in 2003.

The study has also considered the number of citations per year, as way to discriminate the results depending not only in the absolute amount of citations, but also in the relative amount of citations per year. The paper with highest amount of citations per year was published by Brodie, Hollebeek, Juric, and Ilic in 2011, with 59,50 citations per year. The second most cited paper per year was published by Lu, Wu, Mao et al. in 2015, with 44,75 citations per year currently.

Table 3. The 50 most cited papers in CRM research

Journal	R	TC	Title	Author/s	Year	C/Y
JOURNAL OF THE ACADEMY OF MARKETING SCIENCE	1	592	Consumer switching costs: A typology, antecedents, and consequences	Burnham, TA; Frels, JK; Mahajan, V	2003	37,00
JOURNAL OF MARKETING RESEARCH	2	584	The customer relationship management process: Its measurement and impact on performance	Reinartz, W; Krafft, M; Hoyer, WD	2004	38,93
JOURNAL OF MARKETING	3	538	A strategic framework for customer relationship management	Payne, A; Frow, P	2005	38,43
JOURNAL OF MARKETING	4	504	Understanding the effect of customer relationship management efforts on customer retention and customer share development	Verhoef, PC	2003	31,50
DATA & KNOWLEDGE ENGINEERING	5	480	Workflow mining: A survey of issues and approaches	Van der Aalst, WMP; Van Dongen, BF; Herbst, J; Maruster, L; Schimm, G; Weijters, AJMM	2003	30,00
JOURNAL OF SERVICE RESEARCH	6	476	Customer Engagement: Conceptual Domain, Fundamental Propositions, and Implications for Research	Brodie, Roderick J.; Hollebeek, Linda D.; Juric, Biljan; Ilic, Ana	2011	59,50
DECISION SUPPORT SYSTEMS	7	428	An empirical analysis of the antecedents of electronic commerce service continuance	Bhattacherjee, A	2001	23,78
JOURNAL OF MARKETING	8	394	Marketing, business processes, and shareholder value: An organizationally embedded view of marketing activities and the discipline of marketing	Srivastava, RK; Shervani, TA; Fahey, L	1999	19,70
EXPERT SYSTEMS WITH APPLICATIONS	9	330	Application of data mining techniques in customer relationship management: A literature review and classification	Ngai, E. W. T.; Xiu, Li; Chau, D. C. K.	2009	33,00
JOURNAL OF MARKETING	10	322	A customer relationship management roadmap: What is known, potential pitfalls, and where to go	Boulding, W; Staelin, R; Ehret, M; Johnston, WJ	2005	23,00
JOURNAL OF MARKETING	11	322	The role of relational information processes and technology use in customer relationship management	Jayachandran, S; Sharma, S; Kaufman, P; Raman, P	2005	23,00

JOURNAL OF MARKETING	12	321	The influence of cause-related marketing on consumer choice: Does one good turn deserve another?	Barone, MJ; Miyazaki, AD; Taylor, KA	2000	16,89
JOURNAL OF SERVICE RESEARCH	13	280	Challenges and opportunities in multichannel customer management	Neslin, Scott A.; Grewal, Dhruv; Leghorn, Robert; et al.	2005	21,54
JOURNAL OF BUSINESS RESEARCH	14	273	The effect of web interface features on consumer online purchase intentions	Hausman, Angela V.; Siekpe, Jeffirey Sam	2009	27,30
JOURNAL OF OPERATIONS MANAGEMENT	15	273	The impact of enterprise systems on corporate performance: A study of ERP, SCM, and CRM system implementations	Hendricks, Kevin B.; Singhal, Vinod R.; Stratman, Jeff K.	2007	22,75
JOURNAL OF MARKETING	16	261	Why do customer relationship management applications affect customer satisfaction?	Mithas, S; Krishnan, MS; Fornell, C	2005	18,64
INFORMATION SYSTEMS	17	252	Business process mining: An industrial application	van der Aalst, W. M. P.; Reijers, H. A.; Weijters, A. J. M. M.; et al.	2007	21,00
CALIFORNIA MANAGEMENT REVIEW	18	248	A framework for customer relationship management	Winer, RS	2001	13,78
JOURNAL OF MARKETING	19	247	Interaction orientation and firm performance	Ramani, Girish; Kumar, V.	2008	22,45
HARVARD BUSINESS REVIEW	20	243	Understanding customer experience	Meyer, Christopher; Schwager, Andre	2007	20,25
JOURNAL OF THE ACADEMY OF MARKETING SCIENCE	21	238	How can corporate social responsibility activities create value for stakeholders? A systematic review	Peloza, John; Shang, Jingzhi	2011	29,75
HARVARD BUSINESS REVIEW	22	236	Avoid the four perils of CRM	Rigby, DK; Reichheld, FF; Schefter, P	2002	13,88
JOURNAL OF MARKETING	23	230	The Role of Customer Gratitude in Relationship Marketing	Palmatier, Robert W.; Jarvis, Cheryl	2009	23,00

JOURNAL OF PRODUCT INNOVATION MANAGEMENT	24	228	Virtual Customer Environments: Testing a Model of Voluntary Participation in Value Co-creation Activities	Burke; Bechkoff, Jennifer R.; et al. Nambisan, Satish; Baron, Robert A.	2009	22,80
JOURNAL OF SERVICE RESEARCH	25	221	Customer Engagement as a New Perspective in Customer Management	Verhoef, Peter C.; Reinartz, Werner J.; Krafft, Manfred	2010	24,56
JOURNAL OF MARKETING	26	220	Dynamic customer relationship management: Incorporating future considerations into the service retention decision	Lemon, KN; White, TB; Winer, RS	2002	12,94
DECISION SUPPORT SYSTEMS	27	213	Knowledge management and data mining for marketing	Shaw, MJ; Subramaniam, C; Tan, GW; et al.	2001	11,83
JOURNAL OF INTERACTIVE MARKETING	28	207	Interactions in virtual customer environments: Implications for product support and customer relationship management	Nambisan, Satish; Baron, Robert A.	2007	17,25
MIS QUARTERLY	29	207	Reconceptualizing compatibility beliefs in technology acceptance research	Karahanna, Elena; Agarwal, Ritu; Angst, Corey M.	2006	15,92
JOURNAL OF RETAILING	30	207	Building and sustaining profitable customer loyalty for the 21st century	Kumar, V; Shah, D	2004	13,80
JOURNAL OF ADVERTISING	31	206	Consumer responses to corporate social responsibility (CSR) initiatives - Examining the role of brand-cause fit in cause-related marketing	Nan, Xiaoli; Heo, Kwangjun	2007	17,17
INDUSTRIAL MARKETING MANAGEMENT	32	203	An evaluation of divergent perspectives on customer relationship management: Towards a common understanding of an emerging phenomenon	Zablah, AR; Bellenger, DN; Johnston, WJ	2004	13,53
MARKETING SCIENCE	33	192	Marketing models of service and relationships	Rust, Roland T.; Chung, Tuck Siong	2006	14,77
JOURNAL OF MARKETING	34	183	The hidden minefields in the adoption of sales force automation technologies	Speier, C; Venkatesh, V	2002	10,76

DECISION SUPPORT SYSTEMS	35	179	Recommender system application developments: A survey	Lu, Jie; Wu, Dianshuang; Mao, Mingsong; et al.	2015	44,75
JOURNAL OF THE ACADEMY OF MARKETING SCIENCE	36	179	Customer relationship dynamics: Service quality and customer loyalty in the context of varying levels of customer expertise and switching costs	Bell, SJ; Auh, S; Smalley, K	2005	12,79
JOURNAL OF INTERACTIVE MARKETING	37	178	Key Issues in Multichannel Customer Management: Current Knowledge and Future Directions	Neslin, Scott A.; Shankar, Venkatesh	2009	17,80
JOURNAL OF MARKETING	38	177	Is Market Orientation a Source of Sustainable Competitive Advantage or Simply the Cost of Competing?	Kumar, V.; Jones, Eli; Venkatesan, Rajkumar; et al.	2011	22,13
JOURNAL OF MARKETING RESEARCH	39	175	Customer channel migration	Ansari, Asim; Mela, Carl F.; Neslin, Scott A.	2008	15,91
MIS QUARTERLY	40	169	HOW INFORMATION MANAGEMENT CAPABILITY INFLUENCES FIRM PERFORMANCE	Mithas, Sunil; Ramasubbu, Narayan; Sambamurthy, V.	2011	21,13
INDUSTRIAL MARKETING MANAGEMENT	41	168	Demand chain management-integrating marketing and supply chain management	Juttner, Uta; Christopher, Martin; Baker, Susan	2007	14,00
EUROPEAN JOURNAL OF MARKETING	42	161	Role of electronic trust in online retailing - A re-examination of the commitment-trust theory	Mukherjee, Avinandan; Nath, Prithwiraj	2007	13,42
JOURNAL OF MARKETING	43	155	The long-term impact of loyalty programs on consumer purchase behavior and loyalty	Liu, Yuping	2007	12,92
EXPERT SYSTEMS WITH APPLICATIONS	44	154	Churn prediction in subscription services: An application of support vector machines while comparing two parameter-selection techniques	Coussement, Kristof; Van den Poel, Dirk	2008	14,00
JOURNAL OF BUSINESS RESEARCH	45	151	The role of brand/cause fit in the effectiveness of cause-related marketing campaigns	Pracejus, JW; Olsen, GD	2004	10,07

MIS QUARTERLY	46	149	INTERFIRM STRATEGIC INFORMATION FLOWS IN LOGISTICS SUPPLY CHAIN RELATIONSHIPS	Klein, Richard; Rai, Arun	2009	14,90
EXPERT SYSTEMS WITH APPLICATIONS	47	149	An LTV model and customer segmentation based on customer value: a case study on the wireless telecommunication industry	Hwang, H; Jung, T; Suh, E	2004	9,93
DECISION SUPPORT SYSTEMS	48	148	Identification of influencers - Measuring influence in customer networks	Kiss, Christine; Bichler, Martin	2008	13,45
INDUSTRIAL MARKETING MANAGEMENT	49	148	Creating customer knowledge competence: managing customer relationship management programs strategically	Campbell, AJ	2003	9,25
JOURNAL OF THE ACADEMY OF MARKETING SCIENCE	50	146	The differing and mediating roles of trust and relationship commitment in service relationship maintenance and development	Aurier, Philippe; N'Goala, Gilles	2010	16,22

Abbreviations are available in Table 1 except for C/Y = Citations per Year

The most prolific and influential authors

Regarding the study of the most influential authors in Customer Relationship Management research, table 4 presents the 50 authors that have received the highest number of citations.

Verhoef P.C. is the author with the highest number of citations, appearing not far from him two more authors with more than 1.000 citations. These two authors are, in second position Van den Poel D., and the third Kumar V. The fourth author is Krafft, with less than 1.000 citatiosn but almost on the border of that point of cut.

Regarding the precedence of the most productive and influential authors, interesting to say that the most of them come from USA (14 authors in a list of 50). The second and third Country regarding influential authors, are Taiwan and UK (represented in the list by Wales and England), both with 6 appearances.

Table 4. The 50 most productive and influential authors in CRM research

R	Author name	Institution	Country	TP	TC	TC/TP	h	>= 100	>= 50	>= 20
1	VERHOEF PC	Univ Groningen	Netherlands	18	1.690	93,89	14	4	10	14
2	VAN DEN POEL D	Univ Ghent	Belgium	31	1.431	46,16	21	4	11	22
3	KUMAR V	Georgia State Univ	USA	20	1.100	55,00	14	3	6	14
4	KRAFFT M	Univ Munster	Germany	7	953	136,14	6	2	4	5
5	NESLIN SA	Tuck Sch Business Dartmouth	USA	8	747	93,38	8	3	3	6
6	FROW P	Univ Sydney	Australia	5	688	137,60	4	1	2	3
7	PAYNE A	Univ New South Wales	Australia	5	688	137,60	4	1	2	3
8	PALMATIER RW	Univ Washington	USA	6	610	101,67	5	3	5	5
9	JOHNSTON WJ	Georgia State Univ	USA	5	547	109,40	4	2	2	2
10	THOMAS JS	So Methodist Univ	USA	5	529	105,80	5	2	4	4
11	VENKATESAN R	Univ Virginia	USA	10	519	51,90	9	1	5	8
12	JONES E	Louisiana State Univ	USA	4	425	106,25	4	2	4	4
13	LEMON KN	Boston Coll	USA	5	407	81,40	5	1	3	4
14	RUST RT	Univ Maryland	USA	6	404	67,33	5	1	3	5
15	LARIVIERE B	State Univ Ghent	Belgium	4	307	76,75	4	2	3	3

16	COUSSEMENT K	Univ Catholique Lille	France	4	267	66,75	4	1	2	4
17	HOMBURG C	Univ Mannheim	Germany	4	257	64,25	4	0	2	4
18	YEN DC	Miami Univ	USA	5	255	51,00	5	0	2	4
19	PRINZIE A	Univ Ghent	Belgium	8	241	30,13	7	0	1	6
20	RYALS L	Cranfield Univ	England	5	221	44,20	5	1	1	2
21	LEE WB	Hong Kong Polytech Univ	Peoples R China	6	209	34,83	6	0	1	4
22	CHOY KL	Hong Kong Polytech Univ	Peoples R China	7	205	29,29	6	0	1	4
23	MALTHOUSE EC	Northwestern Univ	USA	5	205	41,00	3	1	2	2
24	BRADLOW ET	Univ Penn	USA	4	183	45,75	4	0	1	4
25	HAENLEIN M	ESCP Europe	France	5	166	33,20	3	1	1	1
26	SOHN SY	Yonsei Univ	South Korea	7	131	18,71	5	0	1	2
27	SCHWEIDEL DA	Emory Univ	USA	5	128	25,60	4	0	0	4
28	CHANG HH	Natl Cheng Kung Univ	Taiwan	5	121	24,20	4	0	1	2
29	KNOX S	Cranfield Univ	England	5	112	22,40	5	0	0	2
30	BIJMOLT THA	Univ Groningen	Netherlands	5	109	21,80	4	0	1	2
31	LAMBERT DM	Ohio State Univ	USA	4	108	27,00	4	0	0	3
32	MAKLAN S	Cranfield Univ	England	5	103	20,60	5	0	0	2
33	CHEN YS	Hwa Hsia Univ Technol	Taiwan	4	101	25,25	2	1	1	1
34	KERAMATI A	Univ Tehran	Iran	4	78	19,50	3	0	0	2
35	CHEN YH	Natl Cheng Kung Univ	Taiwan	4	65	16,25	2	0	1	1
36	HA SH	Kyungpook Natl Univ	South Korea	5	52	10,40	3	0	1	1
37	TERHO H	Univ Turku	Finland	6	46	7,67	4	0	0	0
38	VERBANO C	Univ Padua	Italy	5	40	8,00	3	0	0	1
39	CHANG CT	Aletheia Univ	Taiwan	4	40	10,00	4	0	0	1
40	CHIANG WY	Aletheia Univ	Taiwan	4	40	10,00	4	0	0	1
41	BAECKE P	Univ Ghent	Belgium	4	36	9,00	3	0	0	0

42	KIM J	Sejong Cyber Univ	South Korea	5	35	7,00	3	0	0	0
43	DOERR M	Fdn Res & Technol Hellas	Greece	4	32	8,00	3	0	0	1
44	KU ECS	Natl Kaohsiung Univ	Taiwan	4	25	6,25	3	0	0	0
45	CREMA M	Univ Padua	Italy	4	18	4,50	2	0	0	0
46	TUDHOPE D	Univ South Wales	Wales	6	14	2,33	3	0	0	0
47	NICCOLUCCI F	PIN	Italy	5	12	2,40	2	0	0	0
48	VLACHIDIS A	Univ South Wales	Wales	5	11	2,20	2	0	0	0
49	BINDING C	Univ South Wales	Wales	4	9	2,25	2	0	0	0
50	KHASAWNEH R	Jordan Univ Sci & Technol	Jordan	4	0	0,00	0	0	0	0

Abbreviations available in table 1 and table 3, except for Univ = University.

Another interesting view on influence of the authors publishing on Customer Relationship Management research is the study of the co-citations between them. Considering them and using a graphic interface (VosViewer), we can see in Fig 3 the connections between authors that have cited each other studies about this subject.
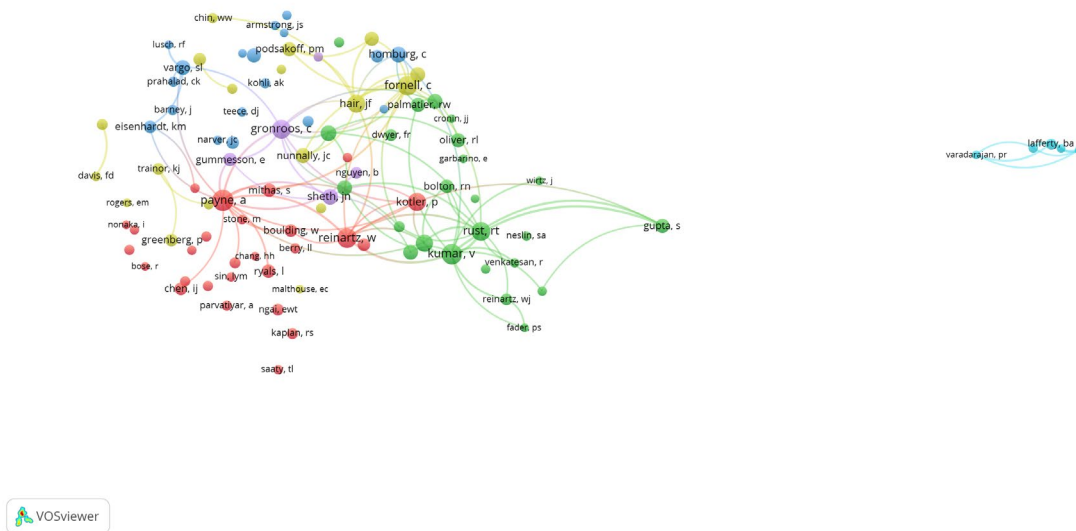

Fig 3. Author co-citations with threshold of 20 citations showing 100 most representative connections

Fig 3 shows an isolated group of co-cited authors where Lafferty is the most relevant one. The rest of the relationships show a very interactive picture where most of the authors have been co-cited by the others, with some special relevant ones: Payne, Reinartz, Gronroos, Hair, Fornell, Kotler, Kumar, Rust. This research has been made reducing the field of study to the 100 most representative connections and considering only the authors with at least 20 citations.

The most productive and influential institutions

The two institutions with highest number of published papers in CRM research are Ghent University (from Belgium) and Hong Kong Polytechnic University (from Peoples R China), with more than 30 papers in the subject. Not far from them, with more than 20 published papers there are Georgia State University (from USA) and University of North Carolina (also from USA).

Concerning the influence of each institution, University of Maryland College Park (from USA) is the one with highest number of total citations (2.070). Next one in the rank is University of Texas Austin (from USA), with 1.991 citations, near the 2.000. In the next group of influence there are 6 Universities with more than 1.000 citations: Cranfield University from England (UK), Ghent University from Belgium, Georgia State University from USA, University of Groningen from Netherlands, Erasmus University of Rotterdam from Netherlands, and University of Munster from Germany. In the first eight positions regarding number of citations, there are then three Universities from USA and two from Netherlands.

If we look into the number of citations per published paper, there are clearly three Universities in the highest positions of the rank: University of Texas Austin (USA), University of Maryland College Park (USA) and Eindhoven University of Technology (Netherlands).

Considering the global picture of all indicators, the most productive and influential entity is Ghent University from Belgium, with the highest number of published papers, the highest h-index, and the fourth position in the rank of total number of citations.

Institutions from all over the world have contributed to Customer Relationship Management research during all the time, but it is clear than a great majority of them are established in USA. There are 25 institutions from USA between the 50 world wide more productive and influential institutions in CRM research, exactly half of the total quantity of institutions contributing to the subject. Other relevant countries are Taiwan (5 institutions), South Korea (4 institutions), and with 3 institutions each one: Peoples R China, Netherlands, and England (UK).

Special case to consider is the Islamic Azad University from Iran, with 10 published papers, nearly to most Universities of the list , but with really small number of citations (only 25) very far from the rest of the institutions.

Table 5. The 50 most productive and influential institutions

R	Institution	Country	TP	TC	TC/TP	h	>= 100	>= 50	>= 20	ARWU	QS
1	GHENT UNIVERSITY	Belgium	31	1.431	46,16	21	4	11	22	61	58.4

2	HONG KONG POLYTECHNIC UNIVERSITY	Peoples R China	30	948	31,60	15	1	4	12	201-300	106
3	GEORGIA STATE UNIVERSITY	USA	25	1.366	54,64	16	4	7	15	-	701-750
4	UNIVERSITY OF NORTH CAROLINA	USA	22	686	31,18	13	0	5	12	30	-
5	CRANFIELD UNIVERSITY	England	19	1.684	88,63	13	4	7	11	-	45
6	NORTHWESTERN UNIVERSITY	USA	19	938	49,37	11	3	6	10	25	34
7	UNIVERSITY OF GRONINGEN	Netherlands	17	1.204	70,82	13	4	8	13	66	120
8	UNIVERSITY OF MARYLAND COLLEGE PARK	USA	17	2.070	121,76	14	7	10	14	51	126
9	UNIVERSITY OF CONNECTICUT	USA	15	979	65,27	13	2	7	12	301-400	373
10	UNIVERSITY OF MUNSTER	Germany	15	1.094	72,93	8	2	5	7	-	-
11	TEXAS A M UNIVERSITY COLLEGE STATION	USA	14	876	62,57	12	2	6	9	-	-
12	UNIVERSITY OF VIRGINIA	USA	14	677	48,36	11	1	7	9	151-200	192
13	ERASMUS UNIVERSITY ROTTERDAM	Netherlands	13	1.121	86,23	11	2	7	11	-	179
14	NATIONAL CHENG KUNG UNIVERSITY	Taiwan	13	268	20,62	10	0	1	5	301-400	234
15	UNIVERSITY OF PENNSYLVANIA	USA	13	558	42,92	12	0	6	10	16	19
16	UNIVERSITY OF WASHINGTON	USA	13	760	58,46	9	4	6	7	14	66
17	YONSEI UNIVERSITY	South Korea	13	301	23,15	9	0	2	5	301-400	107
18	DARTMOUTH COLLEGE	USA	12	846	70,50	10	3	4	8	201-300	183
19	KOREA ADVANCED INSTITUTE OF SCIENCE TECHNOLOGY KAIST	South Korea	12	442	36,83	11	0	4	9	-	-
20	UNIVERSITY OF TEXAS AUSTIN	USA	12	1.991	165,92	11	4	8	11	-	63

21	CHINESE ACADEMY OF SCIENCES	Peoples R China	11	167	15,18	6	0	1	4	-	51-100
22	EWHA WOMANS UNIVERSITY	South Korea	11	217	19,73	6	0	2	3	401-500	319
23	NATIONAL CHENGCHI UNIVERSITY	Taiwan	11	91	8,27	7	0	0	0	-	601-650
24	UNIVERSITY OF PADUA	Italy	11	233	21,18	7	0	1	5	201-300	-
25	UNIVERSITY OF WASHINGTON SEATTLE	USA	11	683	62,09	7	4	5	5	-	-
26	CITY UNIVERSITY OF HONG KONG	Peoples R China	10	366	36,60	7	1	2	5	201-300	55
27	DUKE UNIVERSITY	USA	10	948	94,80	9	4	5	9	26	26
28	INTERNATIONAL BUSINESS MACHINES IBM	India	10	400	40,00	6	0	5	6	-	-
29	ISLAMIC AZAD UNIVERSITY	Iran	10	25	2,50	2	0	0	0	-	-
30	LOUISIANA STATE UNIVERSITY	USA	10	569	56,90	8	2	4	7	301-400	651-700
31	NATIONAL CHUNG CHENG UNIVERSITY	Taiwan	10	168	16,80	7	0	1	2	-	801-1000
32	NATIONAL TSING HUA UNIVERSITY	Taiwan	10	159	15,90	8	0	1	2	401-500	163
33	PURDUE UNIVERSITY	USA	10	233	23,30	8	0	2	4	301-400	100
34	TAMKANG UNIVERSITY	Taiwan	10	109	10,90	5	0	0	2	-	-
35	UNIVERSITY OF GEORGIA	USA	10	489	48,90	8	1	3	5	201-300	431
36	UNIVERSITY OF HOUSTON	USA	10	472	47,20	7	2	5	6	201-301	651-700
37	UNIVERSITY OF SOUTH CAROLINA	USA	10	571	57,10	8	1	3	6	-	561-570
38	EMORY UNIVERSITY	USA	9	634	70,44	7	1	3	5	101-150	148
39	INDIANA UNIVERSITY BLOOMINGTON	USA	9	387	43,00	7	0	3	6	101-150	323
40	NATIONAL UNIVERSITY OF SINGAPORE	Singapore	9	280	31,11	6	0	3	4	85	11

41	SEOUL NATIONAL UNIVERSITY	South Korea	9	146	16,22	5	0	1	1	101-150	36
42	TEMPLE UNIVERSITY	USA	9	150	16,67	6	0	1	3	301-400	651-700
43	UNIVERSITY OF LONDON	England	9	322	35,78	6	0	2	6	151-200	351
44	UNIVERSITY OF MANCHESTER	England	9	301	33,44	6	1	2	5	34	29
45	UNIVERSITY OF MISSOURI COLUMBIA	USA	9	430	47,78	6	2	4	5	-	591-600
46	UNIVERSITY OF NORTH CAROLINA CHAPEL HILL	USA	9	290	32,22	8	0	2	6	-	83
47	UNIVERSITY OF TEHRAN	Iran	9	92	10,22	3	0	0	2	301-400	701-750
48	UNIVERSITY OF TEXAS AT SAN ANTONIO UTSA	USA	9	89	9,89	4	0	0	2	-	-
49	COLUMBIA UNIVERSITY	USA	8	551	68,88	7	3	5	5	8	16
50	EINDHOVEN UNIVERSITY OF TECHNOLOGY	Netherlands	8	967	120,88	7	1	4	7	301-400	99

Abbreviations available from table 1 and table 3; ARWU and QS = Ranking in the general ARWU and QS university rankings

Country analysis

Its very interesting to create a worldwide picture of the country origin of the publications. Country relates in this case to the institution that publishes the paper, but it does not consider the nationality of the researchers who wrote the pushed paper. This makes a tricky situation because lot of researches are used to moving into other countries as USA and UK.

Table 6 shows that USA is clearly the more productive Country with 561 published papers, very far from the 183 papers published by the second one in this case UK. Third Country in this rank is Taiwan, followed by Peoples R China and Germany.

Regarding total number of citations, again USA is clearly the most influential Country in Customer Management Relationship research with 21.966 citations currently. Very far from USA, UK counts with 4.737 citations, being the second more influential Country. Third there is Germany with 3.359 citations, and fourth in the rank there is Netherlands with 3.304 citations so far.

Special mention deserves Spain, where we are developing this research from Universitat Politècnica de València. Spain appears in a commendable eight position of the total of published papers rank.

Finally, in order to take a relative picture of the most productive and influential countries, it's worth to consider the population of each Country and to consider the ratios between total number of papers and total number of citations modelled by the Country population. With this ratio in consideration, Taiwan appears the first as the most productive country on Customer Relationship Management research, with 6,92 papers per million of population. Next to Taiwan there are Cyprus (5,93 papers per million of population) and Finland (with 5,81 papers per million of population). This ratio moves down some of the most productive Countries due to their high Population, for example USA now appears in the seventeenth position, UK in the ninth position, and Peoples R China in the forty fourth position at the bottom of the list.

Same occurs if we divide the total number of cites by the population of the Country. In this case Netherlands comes to the first position in the rank, followed by Belgium, New Zealand, Singapore, and Taiwan. USA and UK which were considered the most absolute influential Countries regarding total number of citations, now appear in eighth and seventh position respectively.

Table 6. The most productive and influential Countries in CRM research

R	Country	TP	TC	TC/TP	h	Pop	TP/Pop	TC/Pop	>= 100	>= 50	>= 20
1	USA	561	21.966	39,16	77	325.719,18	1,72	67,44	57	130	252
2	UK	183	4.737	25,89	35	66.022,27	2,77	71,75	7	24	57
3	TAIWAN	163	2.476	15,19	27	23.545,96	6,92	105,16	1	11	39
4	PEOPLES R CHINA	130	2.731	21,01	30	1.386.395,00	0,09	1,97	4	11	42
5	GERMANY	110	3.359	30,54	26	82.695,00	1,33	40,62	6	15	32
6	SOUTH KOREA	85	2.021	23,78	24	51.466,20	1,65	39,27	3	13	29
7	AUSTRALIA	69	1.307	18,94	21	24.598,93	2,81	53,13	2	5	22
8	SPAIN	60	858	14,30	16	46.572,03	1,29	18,42	1	6	14
9	ITALY	57	611	10,72	15	60.551,42	0,94	10,09	0	3	13
10	INDIA	56	428	7,64	10	1.339.180,13	0,04	0,32	0	4	6
11	FRANCE	54	1.538	28,48	16	67.118,65	0,80	22,91	4	6	14
12	NETHERLANDS	52	3.304	63,54	28	17.132,85	3,04	192,85	7	18	34
13	CANADA	51	1.941	38,06	19	36.708,08	1,39	52,88	6	13	19
14	BELGIUM	43	1.685	39,19	24	11.372,07	3,78	148,17	4	14	26
15	IRAN	37	258	6,97	8	81.162,79	0,46	3,18	0	0	4

16	FINLAND	32	434	13,56	11	5.511,30	5,81	78,75	0	3	7
17	TURKEY	30	262	8,73	9	80.745,02	0,37	3,24	0	0	6
18	GREECE	22	317	14,41	8	10.760,42	2,04	29,46	0	2	6
19	SWITZERLAND	22	142	6,45	5	8.466,02	2,60	16,77	0	1	2
20	SINGAPORE	20	653	32,65	10	5.612,25	3,56	116,35	2	5	8
21	SWEDEN	19	172	9,05	7	10.067,74	1,89	17,08	0	1	3
22	BRAZIL	16	220	13,75	5	209.288,28	0,08	1,05	1	1	3
23	PORTUGAL	16	337	21,06	6	10.293,72	1,55	32,74	1	2	4
24	NORWAY	14	162	11,57	8	5.282,22	2,65	30,67	0	0	3
25	DENMARK	13	148	11,38	7	5.769,60	2,25	25,65	0	0	2
26	MALAYSIA	13	65	5,00	5	31.624,26	0,41	2,06	0	0	1
27	JAPAN	12	210	17,50	6	126.785,80	0,09	1,66	0	1	4
28	POLAND	12	60	5,00	4	37.975,84	0,32	1,58	0	0	1
29	AUSTRIA	11	303	27,55	5	8.809,21	1,25	34,40	1	2	4
30	NEW ZEALAND	11	630	57,27	6	4.793,90	2,29	131,42	1	1	4
31	SOUTH AFRICA	11	88	8,00	3	56.717,16	0,19	1,55	0	1	1
32	ISRAEL	9	204	22,67	6	8.712,40	1,03	23,41	0	2	4
33	ROMANIA	8	13	1,63	2	19.586,54	0,41	0,66	0	0	0
34	SLOVENIA	8	81	10,13	4	2.066,75	3,87	39,19	0	0	2
35	UKRAINE	8	4	0,50	1	44.831,16	0,18	0,09	0	0	0
36	CYPRUS	7	15	2,14	2	1.179,55	5,93	12,72	0	0	0
37	IRELAND	7	63	9,00	4	4.813,61	1,45	13,09	0	0	1
38	LITHUANIA	7	58	8,29	4	2.827,72	2,48	20,51	0	0	0
39	SAUDI ARABIA	7	11	1,57	1	32.938,21	0,21	0,33	0	0	0
40	SLOVAKIA	7	18	2,57	3	5.439,89	1,29	3,31	0	0	0
41	CROATIA	6	73	12,17	3	4.125,70	1,45	17,69	0	1	1
42	PAKISTAN	6	17	2,83	2	197.015,95	0,03	0,09	0	0	0
43	RUSSIA	6	4	0,67	1	144.495,04	0,04	0,03	0	0	0

44	THAILAND	6	31	5,17	2	69.037,51	0,09	0,45	0	0	0
45	BOSNIA HERCEG	5	3	0,60	1	3.507,02	1,43	0,86	0	0	0
46	PERU	5	66	13,20	3	32.165,49	0,16	2,05	0	0	2
47	BANGLADESH	4	22	5,50	1	164.669,75	0,02	0,13	0	0	1
48	CHILE	4	45	11,25	3	18.054,73	0,22	2,49	0	0	1
49	CZECH REPUBLIC	4	11	2,75	2	10.591,32	0,38	1,04	0	0	0
50	HUNGARY	4	10	2,50	1	9.781,13	0,41	1,02	0	0	0

Abbreviations from table 1 and table 3, except for Pop = Population (thousands); TP/Pop = Studies per millions of Population; TC/Pop = Citations per millions of Population

Conclusion

This paper has presented a global overview of the Customer Relationship Management during all its lifecycle up-to-nowadays, with clear conclusions about the takeoff of this technology since year 2.000, and with increasingly influence in the market and the scientific research. The picture obtained about Customer Management Relationship (CRM) has been developed by using bibliometric indicators. The results were generated by using Web of Science (WoS), a general scientific database widely considered currently as one of the most influential one for scientific research. The main contribution of this paper is to use the modern bibliometric tools in order to show how the influence of CRM has been increasing during last decades, being this study supported by the different modern indicators that are being usually considered in the literature. This stated growing influence of CRM during last decades, is the pillar for future invests on investigation about how market is perceiving the value of CRM and which benefits is this technology bringing to modern, dynamic, and successful firms nowadays. Besides, the identified as the most influential authors, institutions, and countries, may be the main study sphere for new and future researches in this field.

After the study, we can conclude that the most influential Journals or Source Titles in the CRM field are clearly EXPERT SYSTEMS WITH APPLICATIONS and JOURNAL OF MARKETING, assessed by the different variables considered in this study, mainly considering the h-index and number of papers with more than 100 citations. The second group of influence is composed by INDUSTRIAL MARKETING MANAGEMENT, JOURNAL OF THE ACADEMY OF MARKETING SCIENCE, DECISION SUPPORT SYSTEMS, and JOURNAL OF BUSINESS RESEARCH, again considering the h-index and the total number of papers published by them and their citations. A challenge of this study is the low number of journals publishing about CRM all over the time; this issue permits, on other hand, a most selective research, focusing in the highest quality ones.

Concerning the qualitative evolution of the subject in the publishing and citing registries, it shows a clear point of inflection in year 2.000, where both number of papers published, and number of citations, started the take-off with a lineal progression. Only since year 2011 to year 2014 the number of publications were lightly going down, but quickly recovering the increasing tendency in 2015.

Clear enough seems the number of citations to conclude about the youngness of the technology. Only 20 percent of the all-time papers have been cited more than 50 times, showing the long path that technology has still to walk in order to arrive to a mature point where the volume of researches and publications may convert it into a study hit.

USA and UK are clearly the most productive and influential Countries concerning most of the analyzed parameters. The most productive authors (with the highest number of publications) come from USA, followed by US and Taiwan. In the same line, institutions from all over the world have contributed to Customer Relationship Management research during all the time, but it is clear than a great majority of them are established in USA: 25 institutions from USA are between the 50 world wide more productive and influential institutions in CRM research, exactly half of the total quantity of institutions contributing to the subject, followed by Taiwan, South Korea, Peoples R China, Netherlands, and England (UK). Finally, if we consider the Countries themselves, the absolute indicators show again the prominent position of USA as the Country with the highest number of papers and citations, far from the second one UK. Other countries like Taiwan, Peoples R China, and Germany stand out about papers published, and other ones as Netherlands, Taiwan, Peoples R China, South Korea, Canada, and Belgium stand out about number of citations.

The main findings of this paper are useful for obtaining a global overview of the state of the art in Customer Relationship Management research according to bibliometric information. The main indicators studied and analyzed have been the number of papers published, the total amount of citations, the h-index, and the most cited items in each category, all of them key indicators for bibliometric analysis. There is a first limitation on this study, considering that this paper aims to be informative in order to identify some relevant research, but also stating that this study is based in the Web Of Science (WoS) so other influential research that is not collected in the WoS is not included in this study. The second limitation is that the ranks used to present the information, in order to classify and analyze the information, are purely informative and not an official result, based on the bibliometric data found in the WoS. Therefore, this paper only provides general information for the general understanding of the field of CRM, but many other issues could be considered in order to getting a complete picture of the state of the art.

The future research efforts may have to be with identifying the most important benefits that the three CRM modules (Sales, Marketing, and Services) can provide the companies with after deploying and effectively using this technology. This would be the base for setting the key clues for showing the critical success factors for companies directly related to the use of CRM solutions.

It is thus determined as a general conclusion that the growing interest in the study of CRM is the demonstration of how the search for sustainable business management models can be based on the intensive and efficient use of CRM as a key technological solution for effective and successful business management. Having determined which authors, entities, and countries are most influential in this field of study, as well as having identified the most influential papers, will be the basis for initiating the next research initiatives in this field.

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Capítulo 3 : Customer relationship management and its impact on Innovation: A literature review

Resumen del Artículo 2: "Customer relationship management and its impact on Innovation: A literature review".

Este artículo, juntamente con el anterior, conforma el estado del arte sobre el que se fundamenta la presente investigación, si bien ambos artículos son completos en sí mismos y no requieren del otro para su comprensión y su desarrollo. Este artículo añade el componente cualitativo a la revisión de la literatura que el capítulo 2 afrontaba desde un punto de vista bibliométrico y por tanto más cuantitativo.

En este caso se ha revisado, leído, y analizado el contenido de los artículos publicados con anterioridad a esta tesis doctoral, en las revistas de reconocido prestigio que se recogen en la Web Of Science Core Database. Para ello se ha seleccionado los artículos de los últimos cinco años que significativamente tratan la interacción entre CRM e Innovación, dado que ya en el capítulo anterior se concluía que la innovación era clave para analizar el impacto de CRM sobre el desempeño organizacional desde la perspectiva de la sostenibilidad. De la lectura de estos, y de las dimensiones usadas para clasificar los artículos, se obtiene un mapa categorizado del contenido de todas las publicaciones que cumplen estos criterios.

Como resultado de la investigación, de entre todas las dimensiones utilizadas para clasificar los artículos más relevantes que combinan CRM con Innovación, destaca la "Retención de Clientes" con más de la mitad de todas las referencias relevantes en CRM. Por el lado de la Innovación, lo mismo ocurre con la dimensión de Innovación de Procesos, mucho más relevante que el resto.

Considerando las dimensiones que se muestran como las más relevantes, la mayoría de las publicaciones referidas al impacto conjunto del CRM y la Innovación se centran en cómo ayudar a las empresas a fidelizar clientes, lo cual parece pues ser la mejor estrategia de negocios en el mundo económico actual, caracterizado por el dinamismo y el cambio constante. Esto está íntimamente relacionado con la capacidad y estrategias de mejora continua a través de la Innovación de Procesos, una potente herramienta de adaptación a un entorno tan dinámico como el de los mercados actuales.

Consistentemente con lo concluido en el capítulo anterior, este artículo confirma el aumento del interés por CRM como objeto de investigación. De igual modo, y de nuevo como conclusión coherente con las conclusiones obtenidas en el artículo del capítulo anterior, no resalta ninguna revista con una cantidad de publicaciones sobre CRM significativamente superior a las de otras revistas, lo cual indica de nuevo que no hay actualmente ninguna revista especialidad en esta temática de estudio en concreto.

Estos resultados ponen de manifiesto y confirman la relevancia de los sistemas CRM como herramienta clave para la consecución del objetivo de fidelización y retención de los clientes (con la consiguiente mejora en el desempeño organizacional de la empresa) y como herramienta determinante en la aplicación de estrategias de Innovación de Procesos (como la mejor forma de adaptarse a un entorno empresarial cambiante y dinámico).

En el mundo empresarial actual se confirma pues la importancia de disponer de una buena estrategia de *Customer Relationship Management* sustentada por el despliegue de alguna de las soluciones CRM existentes en el mercado, y de una buena estrategia de Innovación de procesos que acompañe y complemente el uso de esta herramienta.

Visto pues el interés que estas soluciones suscitan como temática de estudio, se propone una agenda de investigaciones futuras, entre las que se encuentra el planteamiento de un mapa de beneficios esperados del uso de CRM juntamente con las estrategias de innovación, así como la creación y validación empírica de un modelo de investigación sobre el impacto de uso de CRM sobre el desempeño organizacional. Estas acciones se han tenido en cuenta en el planteamiento y desarrollo de los siguientes capítulos.

Datos de publicación del Artículo 2: "Customer relationship management and its impact on Innovation: A literature review".

Los autores de este artículo son Vicente Guerola Navarro, Raul Oltra Badenes, Hermenegildo Gil Gómez, y Javier Sendra García.

Los datos de publicación más relevantes:

- ➢ Publicación: *Journal of Business Research (JBR)*
- ➢ Índices de impacto:
  - ○ JCR: 1er Cuartil, con factor de impacto 4.874 (en 2019). En los últimos 5 años factor de impacto 5.484
  - ○ SJR: percentil 95, con posición 9/177 en 2019, con un índice de impacto de 1.871
- ➢ Editorial: ELSEVIER SCIENCE INC.
- ➢ ISSN: 0148-2963
- ➢ Fecha: 04-marzo-2021
- ➢ Volumen: 129
- ➢ Páginas: 83-87
- ➢ DOI: https://doi.org/10.1016/j.jbusres.2021.02.050

El artículo ha sido publicado en marzo de 2021 en la revista de investigación científica *Journal of Business Research (JBR)*. El Journal of Business Research aplica la teoría desarrollada a partir de la investigación empresarial a situaciones empresariales reales. Al reconocer las intrincadas relaciones entre las muchas áreas de actividad empresarial, JBR examina una amplia variedad de decisiones, procesos y actividades empresariales dentro del entorno empresarial real. Los avances teóricos y empíricos en el comportamiento del comprador, las finanzas, la teoría y el comportamiento organizacional, el marketing, el riesgo y los seguros y los negocios internacionales se evalúan de forma regular. Publicada para ejecutivos, investigadores y académicos por igual, la revista ayuda a la aplicación de la investigación empírica a situaciones prácticas y hallazgos teóricos a la realidad del mundo empresarial.

JBR es una publicación científica en el área de las ciencias sociales, que está indexada en el índice internacional *Journal Citations Report*, más conocido como índice **JCR**, en el área de "Business", con un factor de impacto de 4.874, siendo su factor de impacto 5.484 en los últimos 5 años. Con ello, en 2019 la revista se sitúa en el primer cuartil de su categoría dentro del índice JCR.

JBR también está indexada en el índice *SCImago Journal and Country Rank*, conocido como **SJR**, con un impacto de 1.871, situándose en el percentil 95 (ocupando la posición 9 dentro del ranking de las 177 primeras) de este índice internacional, dentro de la categoría de "Business, Management and Accounting".

Finalmente, JBR aparece indexada en el índice *Source Normalized Impact per Paper*, conocido como **SNIP**. En este caso, SNIP mide las citas reales recibidas en relación con las citas esperadas para el campo temático en cuestión, y en este caso JBR tiene un índice de impacto SNIP de 2.760 en 2019.

Este artículo da respuesta pues, junto al capítulo anterior, a los objetivos de búsqueda de un marco conceptual sobre el que desarrollar el estudio completo propuesto en la introducción de esta tesis doctoral. El enfoque cualitativo que se ha dado a esta revisión y categorización de la

literatura, ha permitido ahondar en el conocimiento de todas las dimensiones relevantes en cualquier estudio que relacione el uso de CRM y el despliegue de estrategias de innovación con la obtención de mejoras en el desempeño organizacional.

Customer relationship management and its impact on Innovation: A literature review.

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Abstract

In today's dynamic, changing market, customer relationship management supported by a powerful technological solution for business management such as Customer Relationship Management (CRM) is essential for business success. It has proven to be one of the fastest growing technological solutions due to the impact of its implementation on the return on investment. This article presents an exhaustive review of previously published findings and studies the reality of CRM in business through a qualitative, descriptive approach, reviewing the

present-day literature on the impact of CRM in the modern business environment. This article reviews the 17 most recent and most relevant studies on how CRM affects the development of Business Innovation policies, focusing on the period from 2015 to 2019.

1.- Introduction

When the dynamism of the market causes constant changes in customer expectations, a customer-centered approach to business strategy is required, where the value chain begins and ends with the customer (Díez de Castro et al., 2002). This business approach can be achieved using technological tools for business (Guerola-Navarro et al., 2020b; Oltra-Badenes et al., 2019) such as Enterprise Resource Planning (ERP) and Customer Relationship Management (CRM).

Among the technological solutions for business management, CRM is essential for establishing effective channels and methods for customer-centric information management. Its main objective is to improve the management of customer relationships to facilitate better commercial results for companies (Guerola-Navarro et al., 2020a). The need for consistent management of customer information is essential for business decision makers (Payne and Frow, 2005), which makes CRM a fundamental tool. Gil-Gomez et al. (2020) corroborate the importance of CRM as a key tool in the digital transformation of the business world, not only due to its potential to improve current management (and exploitation), but also because of its potential to develop the capacity for innovation (and exploration). Existing models to measure the impact of the use of CRM on firm performance are based on the intermediate variable of Innovation Capacity (Guerola-Navarro et al., 2020c).

This proposal to study the reality of CRM through scientific research seeks to effectively demonstrate that CRM is one of the most powerful modern tools to manage the business reality of customer relationships. It emerged in the 1970s as a technological solution for companies to automate the management of the internal sales force (Buttle, 2004). Currently CRM is much more than sales force automation, having become one of the most powerful channels to sustainably manage (currently and in the future through continuous innovation) a 'customer-centered' business reality.

In order to establish the playing field on which CRM has been developed as a technological management solution with high impact and great interest in scientific study, the authors follow Hernández Sampieri et al.'s (1996) complementarity theory, using a quantitative approach to the analysis of the publications and citations referring to the area under study, together with the qualitative analysis of the most relevant publications.

The quantitative approach was presented by Guerola-Navarro et al. (2020b) through a bibliometric study in which the most relevant methods used in the study of CRM as business management technology are analysed and presented in a quantified and evolutionary manner. To this end, the authors, entities, countries, etc. were identified and shown as the most productive (with the greatest number of publications in this regard) and the most influential (with the greatest number of citations), with official registries in the most recognized scientific databases.

Systematic reviews of the CRM literature are part of the qualitative approach to analysis, as seen in Ngai's (2005) review of academic literature on CRM from 1992 to 2002 and in the work of Ngai et al. (2009), who built an academic database of literature for the period 2000 to 2006 and proposed a technique to classify these articles. More recently, Soltani and Navimipour (2016) systematically reviewed the cutting-edge literature on CRM mechanisms and offered recommendations for future research.

There is no study in the existing literature that encompasses the most recent findings on the impact of CRM together with Business Innovation. This gap in the research on CRM and its relationship to Innovation arouses a great deal of interest in carrying out a new, extensive review of the literature on this subject (CRM and Innovation).

This article addresses this research gap, complementing the existing bibliometric studies on CRM through a qualitative, descriptive study, analysing the business reality of CRM through a focus on Innovation. This qualitative approach, together with the quantitative approach to bibliometric analyses, establishes a comprehensive review of the literature that can be used to support future research on the use and impact of CRM systems.

In order to present a picture that structures the most relevant focuses of the joint study of CRM and Innovation, as two of the most relevant factors in the search for improvements in firm performance, the Research Methodology used is presented below, as well as the Classification Methodology that was followed with the papers identified as relevant for the study. The results are presented below, structured in the tables, with analyses provided in the comments, leading finally to the conclusions.

2.- Research methodology

There are several approaches to define a literature review for a specific research theme and various methods for conducting it. Snyder (2019) notes that a 'literature review can be broadly described as a more or less systematic way of collecting and synthesizing previous research', raising questions about the quality and trustworthiness of classical literature review studies and establishing guidelines for new methods.

There are several types of systematic review (Callahan, 2010):

- structured reviews focusing on widely used methods, theories, and constructs
- framework-based studies
- hybrid-narrative studies with a framework for setting the future research agenda
- theory-based reviews
- meta-analyses
- bibliometric reviews
- reviews aimed at model or framework development

Following the **semi-systematic review** procedures (Snyder, 2019), this paper has four stages:

1. **Design** the review. The bibliometric studies analysed show a growing interest in the use of CRM in modern, competitive companies. The aim of this study is to discern, in a qualitative way (and complementary to bibliometric studies), which are the most

significant and relevant areas that mark the interest in CRM as business management technology. For this purpose, the Web of Science Core Collection database for the period 2015 to 2109 was used.

2. **Conduct** the review. The publications in impact journals were identified, all of which refer to the interaction between CRM and Innovation. For this purpose, 'CRM' and 'Innovation' were used as search keywords, and subsequently those publications that were not relevant to the field of study were eliminated. The resulting publications were then read very carefully.

3. **Analyse**. Through the complementary use of bibliometric studies and related previous literature reviews, the most appropriate dimensions and elements were selected for the study of the reality of CRM and Innovation, carefully analysing each of the publications selected in the previous section.

4. **Structure and write** the review. This study follows the good practices of scientific literature, including an introduction to the object and scope of the work, a description of the methodology used, an orderly and categorized presentation of results, and finally, the conclusions of the study.

In this case, the database chosen was the **Web of Science (WoS)**, which is owned by Thomson Reuters. In the field of scientific research, it is generally assumed that the WoS contains only high-quality journals characterized by timely publication and reviews of papers, scientific criteria for the peer review process, broad dissemination through the Internet and the most widely used channels for the publication of scientific research. Therefore, WoS was considered the most appropriate database for this study.

The **Web of Science Core Collection** database, which is the main and most comprehensive one in WoS, formed the core database for this study. The search in the remaining databases accessible from the Web of Science and from the Scopus database did not provide papers relevant for this study; thus, the query in the WoS Core Collection was accepted as appropriate for the purpose of this paper. The period used in the literature search for this study was 2015 to 2019, with the aim of analysing the most relevant publications in the field for the last 5 complete years. It was based on the search strings '**customer relationship management**', '**CRM**' and '**Innovation**'. The search returned **130 results** from the Web of Science Core Collection in these areas for this timeframe. *Document Type* was the second filtering criteria (Merigó et al., 2015; Guerola-Navarro et al., 2020b), considering: **articles**, **reviews**, **notes,** and **letters**, obtaining a total of **98 results**.

Trying to refine the results by highlighting the business impactful related articles, the following **WoS categories** were selected as additional filter criteria: business, management, operations research management science, computer science information systems, information science, library science, computer science interdisciplinary applications, and economics. The result provided **79 articles**.

The final criteria for discarding the irrelevant articles for our study was, after reading all of them carefully, to eliminate from our study database:

- Articles whose content is not relevant for the study
- Articles that may be relevant to CRM but not to Innovation, and those relevant to Innovation but not to CRM.

- The articles that were more technical than business-focused, given that this paper pursues a clear business orientation.

The study was finally conducted based on the **17 articles** that resulted from the above criteria used in WoS. The methodology that was used to classify these articles is now described in the following section.

3.- Classification methodology

The first step in classifying the relevant articles for the CRM and Innovation interaction area was to identify the dimensions that characterize CRM and Innovation, following previous relevant studies (Ngai, 2005; Liao et al., 2007; Damanpour, 1996).

3.1.- CRM dimensions

In order to classify the articles selected for this study based on the CRM dimensions proposed by previous studies when defining CRM as a tool to identify the most valuable clients, attract them as trusted clients, retain them with loyalty policies, and develop a lasting partnership with them, in this paper the following dimensions were used (Ngai, 2005):

- **Customer identification**: identifies the actions coordinated and directed by the company to find out which individuals may interest the company as potential customers. It normally includes target customer analysis and customer segmentation.
- **Customer attraction**: identifies the steps that a company can take to attract customer interest in their goods and services. Marketing action planning is the most accurate strategy for this stage.
- **Customer retention**: it includes any business strategy aimed at building customer loyalty, and establishing long-term and trustworthy business relationships with customers, with the aim that these customers maintain a sustainable level of repetitive purchases from the company. A good level of customer service and support is a very valuable tool for achieving this objective.
- **Customer development**: refers to any effort to expand commercial and trust relationships with existing customers to secure new lines of business shared with customers. Customer lifetime value analysis, Upselling and cross-selling, and Market Basket Analysis are activities included in this framework.

These four CRM dimensions proposed by Ngai (2005) were used to classify the relevant selected articles that cover the research study of CRM and Innovation capabilities for the selected timeframe.

3.2.- Innovation dimensions

In addition to the dimensions used for CRM and given that Innovation is the second basic pillar of this study, the literature was reviewed to identify which dimensions of innovation capacity are the most appropriate to classify the selected articles.

In search of the most relevant studies on the dimensions of Innovation, and within the context of business management, Ru - Jen et al. (2010) highlight the innovation capabilities that influence the area of impact of CRM on strategy and business results (Liao et al., 2007; Damanpour, 1996):

- **Product Innovation**: refers to the development of new products and innovative features for existing products
- **Process Innovation**: procedural changes in the production area to achieve better results through improved goods and services for customers
- **Administrative Innovation**: any strategy to improve internal or external processes that result in better, more comprehensive management of the company
- **Marketing Innovation**: all those activities focused on identifying how to make marketing campaigns more effective by improving transmission of the added value of the supply of goods and services to customers.
- **Service Innovation**: in line with achieving customer loyalty and long-term commitment, any impact activity such as customer service and support.

As in the previous analysis of CRM dimensions, these Innovation dimensions were used to classify the selected articles.

3.3.- Classification process

The objective of the article is to classify the selected articles based on the dimensions identified for CRM and Innovation. Therefore, each article was carefully read and those that were not closely related to CRM were discarded. Next, the dimensions of CRM that were relevant for the study were identified from the selected articles. The same process was followed for Innovation capacity; the most relevant innovation dimensions of each article were identified. Finally, the resulting tables were analysed to draw conclusions that can be used in the design of a future research agenda on the impact of CRM and Innovation.

4.- Results

Following the proposed classification methodology, the most relevant CRM and Innovation dimensions were identified for each of the 17 articles selected in this study. The next step of result analysis involved the classification of articles based on the combination of CRM dimensions first, and Innovation dimensions second. This classification, with the combinations of dimensions that have at least one result is:

- Customer attraction:
    - Process Innovation: Rezazadeh & Nobari (2018)
    - Marketing Innovation: Mehrabi et al. (2019)
    - Service Innovation: Bucic et al. (2017)
- Customer development:
    - Process Innovation: Chierici et al. (2019); Hollebeek et al. (2019); Vargha (2018)
    - Service Innovation: Kamboj et al. (2016)
- Customer retention:

- Process Innovation: Cruz-Jesus et al. (2019); Elfarmawi (2019); Von Krogh et al. (2018); Zand et al. (2018); Oderanti & Li (2018); Valmohammadi (2017); Fidel et al. (2016)
- Administrative Innovation: Khosravi & Nilashi (2018)
- Marketing Innovation: Büyükdağ et al. (2019)
- Service Innovation: Tsou & Chen (2019)

The combinations of CRM and Innovation dimensions that do not appear in this study were not relevant to the selected publications. Next, the classified articles were analysed from different points of view, based on their key dimensions.

4.1.- Distribution of the selected articles by CRM dimension and Innovation dimension

Based on the previous classification and moving on to the quantitative analysis of the classification articles, Table 1 shows the quantitative vision of the results. The reference to each dimension indicates the number of results and the percentage (in brackets) of the total of 17 articles.

Table 1. Distribution of the selected articles by CRM dimension and Innovation dimension. Source: the authors

Table 1 shows that the CRM dimension 'Customer Retention' encompasses more than half of the cases analysed, specifically 10 out of the total of 17 cases, which represents 58.82% of the total. It is followed by Customer Development with 4 cases and 23.53% of the total, and Customer Attraction with 3 cases and 17.65% of the total. The Customer Identification dimension did not appear in any case.

To gauge the importance of each Innovation dimension, Table 2 was constructed, in which the 17 articles selected are classified according to their Innovation dimension.

Table 2. Distribution of the selected articles by Innovation dimension. Source: the authors

As can be seen in Table 2, the most relevant Innovation dimension in the selected articles is Process Innovation, with 11 occurrences – 64.71% of the total occurrences. No occurrence of Product Innovation appears, and the rest are far from the first in relevance.

4.2.- Distribution of the selected articles by year of publication

Table 3 shows the selected articles, classified according to their year of publication.

Table 3. Distribution of the selected articles by year of publication. Source: the authors

There is clear and growing interest in the interaction between CRM and Innovation, increasing from 0% in 2016 to more than 42% in 2019. This growing interest increases the relevance of this study.

4.3.- Distribution of the selected articles by journal and number of citations

Looking at the records of the 17 selected publications, exactly 17 Journals appear with one article each, which shows that in recent years there is no journal that has specifically specialized in the study of the convergence of CRM and Innovation.

Regarding the distribution of the selected articles by number of citations, Hollebeek et al. (2019) clearly have the maximum number, with 169 citations, constituting approximately 90% of the total citations of the 17 selected articles. The rest of the publications have a maximum of 15 citations, which makes them much less influential than Hollebeek et al. (2019).

5.- Conclusions

This paper constitutes, together with the bibliometric studies on CRM, one of the most contemporaneous analyses on the relevance of CRM among the most-used business solutions with the greatest projection today.

Among all the dimensions used to classify the most relevant articles that combine CRM with Innovation, Customer Retention stands out with more than half of all relevant references on CRM. In terms of Innovation, the Process Innovation dimension appears as the most significant.

Considering the dominant dimensions, most of the publications referring to the joint impact of CRM and Innovation focus on how to help companies retain customers, which is consistently presented as the best business strategy in the current economic world, characterized by dynamism and constant change. This is closely related to the power of constant improvement through Process Innovation, a powerful tool for adapting to the environment.

On the other hand, seeing the evolution of the selected publications with time, an increase in interest in the subject is evident, with almost half of the total articles published last year. On the other hand, there is no relevant and distinctive indication in this regard in any of the journals reviewed.

These results show the relevance of CRM as a key tool for customer loyalty reinforcement (with the subsequent improvement in firm performance) and for implementing Process Innovation to adapt to the changing business environment. Both sides of CRM reality make CRM one of the most impactful business tools for successful companies in the present business world.

The value of this study, from a practical point of view, is the identification of the most relevant aspects that make CRM an extremely valuable business management solution. The identification of these elements can help business decision makers to define the decision criteria on the CRM

system to be implemented, based on their convenience in terms of the impact on organizational performance, together with the deployment of innovation strategies in the companies.

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Tables

CRM Dimension	Innovation Dimension
Customer attraction: **3 (17.65%)**	Process Innovation: **1 (5.88%)**
	Marketing Innovation: **1 (5.88%)**
	Service Innovation: **1 (5.88%)**
Customer Development: **4 (23.53%)**	Process Innovation: **3 (17.66%)**
	Service Innovation: **1 (5.88%)**
Customer Retention: **10 (58.82%)**	Process Innovation: **7 (41.18%)**
	Administrative Innovation: **1 (5.88%)**
	Marketing Innovation: **1 (5.88%)**
	Service Innovation: **1 (5.88%)**

Table 4. Distribution of the selected articles by CRM dimension and Innovation dimension. Source: the authors

Innovation dimension	Occurrences (percentage)
Product Innovation	**0 (0%)**
Process Innovation	**11 (64.71%)**
Administrative Innovation	**1 (5.88%)**
Marketing Innovation	**2 (11.76%)**
Service Innovation	**3 (17.65%)**

Table 5. Distribution of the selected articles by Innovation dimension. Source: the authors

Year of publication	Number of articles and percentage
2015	**0 (0%)**
2016	**2 (11.76%)**
2017	**2 (11.76%)**
2018	**6 (35.29%)**
2019	**7 (41.18%)**

Table 6. Distribution of the selected articles by year of publication. Source: the authors

Capítulo 4 : Customer relationship management: digital transformation and sustainable business model innovation

Resumen del Artículo 3: "Customer relationship management: digital transformation and sustainable business model innovation".

Este artículo se basa en el marco conceptual definido por los artículos de los dos capítulos anteriores, en los que se determinaba de forma cuantitativa (mediante un estudio bibliométrico) y cualitativa (mediante una revisión de literatura profunda) cuales son las dimensiones y elementos más relevantes en cualquier estudio que vincule CRM con Innovación y con Desempeño Organizacional (como es el caso del trabajo de investigación propuesto en esta tesis doctoral).

Tomando como punto de partida los esfuerzos de las empresas por mejorar su gestión sobre el conocimiento del cliente, así como por implementar eficientes planes de innovación, sumado a los esfuerzos de las empresas hacia la transformación digital, este artículo plasma de forma clara y concisa cuales son los beneficios esperados del uso de CRM por parte de las empresas. Este mapa de beneficios se construye siguiendo el esquema de dos modernas líneas de investigación que concurren en la búsqueda de soluciones cuyo impacto sea sostenido en el tiempo: "A*mbidexterity"* y *"Sustainability".* Tras revisar la literatura publicada sobre el uso e impacto de los sistemas CRM, se ha llegado al planteamiento de dos canales de provisión de beneficios encaminados a la obtención de mejoras de desempeño organizacional: de un lado el de la explotación actual de una gestión eficaz y eficiente del conocimiento que se tiene sobre los clientes, y de otro lado el de la exploración o búsqueda de planteamientos innovadores a futuro que garanticen que los beneficios no se vayan a quedar en el momento presente sino que tengan una continuidad en el tiempo. Con ello efectivamente se recogen los principios tanto de la línea de investigación de "*Ambidexterity"* (por el uso no solo del enfoque presente sino del enfoque futuro) como de la línea de investigación de "*Sustainability*" (por el enfoque del mantenimiento de beneficios en el tiempo). En este artículo, se plantea pues cómo el uso de los tres módulos de CRM (ventas, marketing, y servicios) puede aportar mejoras en el conocimiento que se tiene del cliente, lo cual debería (por hipótesis) de traer consigo el direccionamiento hacia un valioso camino de fidelización de clientes que haga sostenible y duradero el impacto del uso de CRM sobre el desempeño organizacional.

Por el camino de la gestión presente del conocimiento sobre el cliente, el mapa de beneficios planteado en este capítulo pretende demostrar cómo CRM ayuda a las empresas a tener éxito a través de una estrategia de gestión del conocimiento del cliente consistente y bien estructurada. Un primer resultado positivo es el aumento de la lealtad del cliente, cuya eficacia representa una empresa centrada en el cliente y, por lo tanto, exitosa sobre la base de los principios del marketing relacional. Un segundo efecto beneficioso radica en la mejora de la efectividad de la estrategia de marketing, ya que CRM puede proporcionar a las partes interesadas del marketing interno información clave para planificar y optar por las campañas y acciones de marketing más efectivas para la orientación al cliente. Un mejor servicio y soporte al cliente es el tercer beneficio relacionado con CRM, directamente conectado con el área de servicios, y un factor crucial para asegurar que una empresa retenga a sus mejores clientes a través de una estrategia eficiente de retención de objetivos basada en un cliente posventa mejorado. experiencia. Por último, una cuarta ventaja relacionada radica en la búsqueda de eficiencia y reducción de costes, dada la necesidad de las empresas de adaptar sus esfuerzos de ventas, marketing y servicio a los objetivos y características específicas de cada cliente.

Por el lado de la innovación y mejora a futuro, se han considerado cinco ejes centrales: producto, proceso, administrativo, marketing y servicios. Los cinco describen cómo las empresas dirigen sus esfuerzos hacia una inversión eficaz en la mejora de los procesos comerciales internos y externos. En este sentido, una validación empírica de nuestro modelo de investigación propuesto puede permitir a los investigadores cuantificar el impacto de cada eje en el desarrollo e implementación de políticas de ventas, marketing y servicios pioneras y eficientes.

Datos de publicación del Artículo 3: "Customer relationship management: digital transformation and sustainable business model innovation".

Los autores de este artículo son Hermenegildo Gil Gómez , Vicente Guerola Navarro, Raul Oltra Badenes, y Jose Antonio Lozano Quilis.

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El artículo ha sido publicado en el volumen 33 y número 1 de la revista de investigación científica *Economic Research-Ekonomska Istraživanja*.

Economic Research-Ekonomska Istraživanja es una revista "Open-Access", con proceso de revisión por pares, que publica artículos teóricos, aplicados y empíricos sobre economía (nano, micro, mezzo y macro). La revista tiene como objetivo explorar todos los puntos de vista sobre temas de investigación económica que contribuyan al desarrollo de las economías globales. Economic Research-Ekonomska Istraživanja publica rigurosos artículos científicos que hacen una contribución significativa a cualquier campo de la economía, teórica, aplicada o empírica, con especial atención a las experiencias de la transición del socialismo a las economías de mercado en Europa del Este. Se pone especial interés en las nuevas investigaciones sobre el desarrollo regional en otras áreas geográficas, en particular los trabajos que abordan cuestiones teóricas y empíricas en economía para países en desarrollo y antiguas economías en desarrollo. La revista fomenta las investigaciones que exploran temas económicos amplios que puedan contribuir al desarrollo de la economía.

Los temas sobre los que esta revista presta mayor atención son: emprendiduría, economía del desarrollo, teoría económica, Innovación y conocimiento, metodología de investigación económica, sostenibilidad, desafíos para la ciencia económica, y economía del desarrollo.

Economic Research-Ekonomska Istraživanja es una publicación científica en el área de las ciencias sociales, que está indexada en el índice internacional *Journal Citations Report*, más conocido como índice **JCR**, en el área de "ECONOMICS", con un factor de impacto de 2.229, siendo su factor de impacto 2.167 en los últimos 5 años. Con ello, en 2019 la revista se sitúa en el segundo cuartil (Q2) de su categoría dentro del índice JCR.

Economic Research-Ekonomska Istraživanja también está indexada en el índice *SCImago Journal and Country Rank*, conocido como **SJR**, en el área Economics, Econometrics and Finance:

Economics and Econometrics, con un índice de impacto de 0.490, situándose en el percentil 67 (ocupando la posición 208 dentro del ranking de las 637 primeras) de este índice internacional.

Finalmente, esta revista aparece indexada en el índice *Source Normalized Impact per Paper*, conocido como **SNIP**. En este caso, SNIP mide las citas reales recibidas en relación con las citas esperadas para el campo temático en cuestión, y en este caso tiene un índice de impacto SNIP de 1.226 en 2019.

Tras plantear en los capítulos anteriores el marco conceptual sobre el que desarrollar la investigación, en este capítulo se ha procedido a plantear cuales son los beneficios esperados del uso de la tecnología en estudio (CRM), atendiendo a dos líneas de trabajo: la presente y la futura. Este planteamiento se ha hecho en base a los conocimientos adquiridos durante la revisión de literatura y el estudio bibliométrico iniciales, y se ha dividido en las dos líneas propuestas (presente y futura) en base a las modernas teorías de gestión que pretenden conseguir un efecto sostenible y duradero en el tiempo que consolide y dé mayor relevancia a los resultados obtenidos. Se ha identificado, en base a la literatura, a la gestión del conocimiento del cliente como la primera dimensión (la del presente, la actual) de beneficios de explotación de CRM, y a la innovación como la segunda dimensión (la futura, la de "exploración") de beneficios del uso de CRM. En el siguiente capítulo se construye un modelo de investigación que contiene las variables identificadas en este modelo, con los constructos y elementos propuestos para validar el modelo, y las hipótesis de partida a validar. En este nuevo capítulo, dado que prima en nuestro estudio la vertiente de la sostenibilidad, el modelo de investigación para se ha centrado en la línea de la Innovación, dejando para posteriores investigaciones la creación de otros modelos centrados en la explotación de la gestión del conocimiento del cliente.

Artículo 3: "Customer relationship management: digital transformation and sustainable business model innovation".

Customer Relationship Management: Digital transformation and sustainable business model innovation

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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.

Keywords: Customer Relationship Management, Sustainability, Green IT, Common Goods, Customer Knowledge Management, Innovation

Introduction

This paper proposes a research model to analyze 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 et al., 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 et al., 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 organizations 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 optimizing 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 organizational behavior. 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 organizational 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 organizational change, that we have understood the need to conduct further research on the two main variables of ambidextrous organizations: 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 centered on two crucial variables of ambidextrous organizations, 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, analyzed 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): s**ales, marketing,** and **services**.

In fact, Scullin et al. (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, analyze 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 et al., 2005). Since the basic strategic goals of each organization include long-term growth and sustainability (Pohludka et al., 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 et al., 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 centralize 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 personalization 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 et al., 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 personalized marketing campaigns for successful companies, with a higher impact on their sales and profitability (Greenberg, 2001). In fact, Rong et al. (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 center 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 and 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 et al., 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 et al., 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 et al., 2015). CKM is also an important strategic resource with a considerably positive influence on marketing operations (Huang and 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 organizational tools, practices, and soft skills focused 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 et al., 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 (Fruhling & Siau, 2007; Lin et al., 2012; Gorry & Westbrook, 2013; Sofianti et al., 2013; Chua & Banerjee, 2013; July-Abid & Ali, 2014). More recently, Fidel et al. (2018) have studied its influence on business innovation capabilities.

The current globalization 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 maximize revenues (Constantinos et al., 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 centers 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 organizations rely on CRM software systems to track and analyze customer-related information since their relations with customers can be greatly improved by using Information Technology (IT) (Karimi et al., 2001). Customization 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 et al., 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 et al., 2001). Successful firms have discovered how to efficiently drive their marketing efforts by prioritizing 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 customization 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 (Romano, 2000; Massey et al., 2001)

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 organization'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 utilize 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 et al., 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 (Rao & Draziz, 2002; Zhu & Nakata, 2007; Grawe et al., 2009; Soliman, 2011; Lin et al., 2012; Pil & Holwelg, 2003).

Menguc and Auh (2006) consider IO to be an organizational resource, equally contributing to increasing and maintaining competitive advantage (Hult & Ketchen, 2001). On their part, Hult et al. (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).

Organizational innovation is particularly critical for SMEs, and especially for small firms (Gallego et al., 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 et al. (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 et al. (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 et al. (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 organizational 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 favors 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 programs 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 summarize our concluding remarks from the previous theoretical discussion, the following map (Figure 1) represents the benefits expected of CRM implementation, both in terms of current exploitation (Customer Knowledge Management), and prospective exploration (innovation):
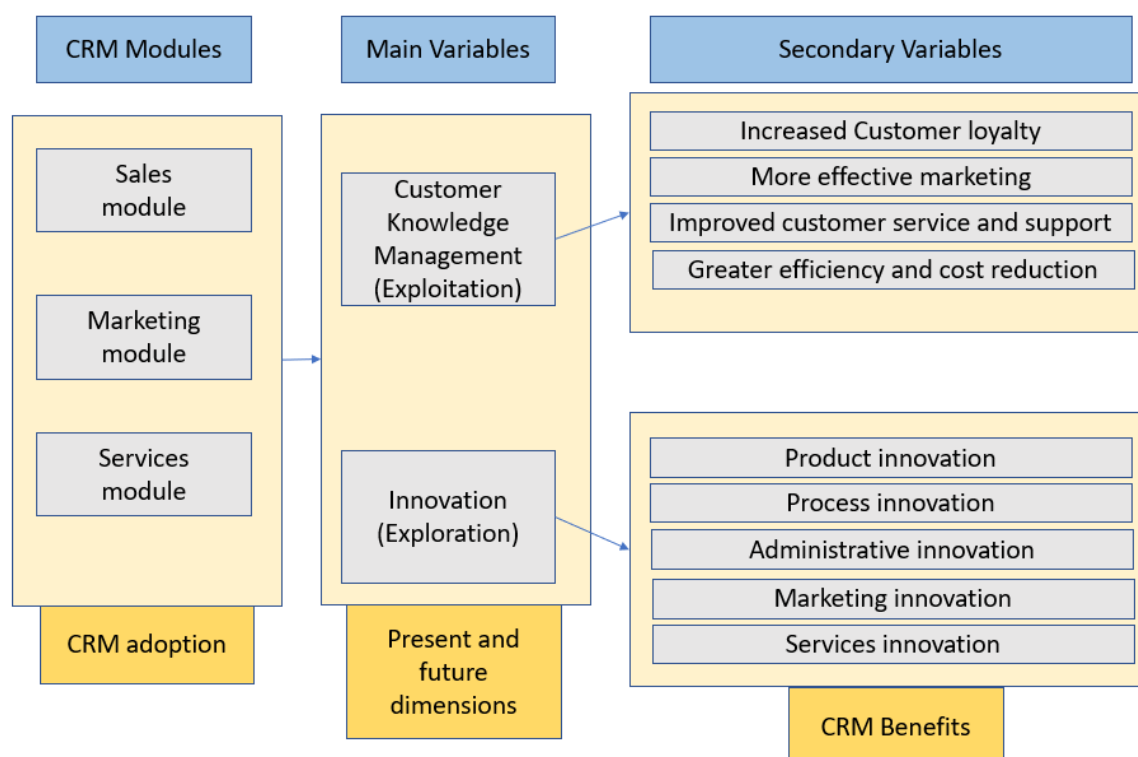

Figure 1. CRM benefit map

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 organizational 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 defines sustainability as the "development that meets the needs of the present without compromising the ability of future generations to meet their own needs" (1987). 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 organization's business processes, activities, and operations on its natural environment, this influence being either positive or negative (Mishra et al., 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.
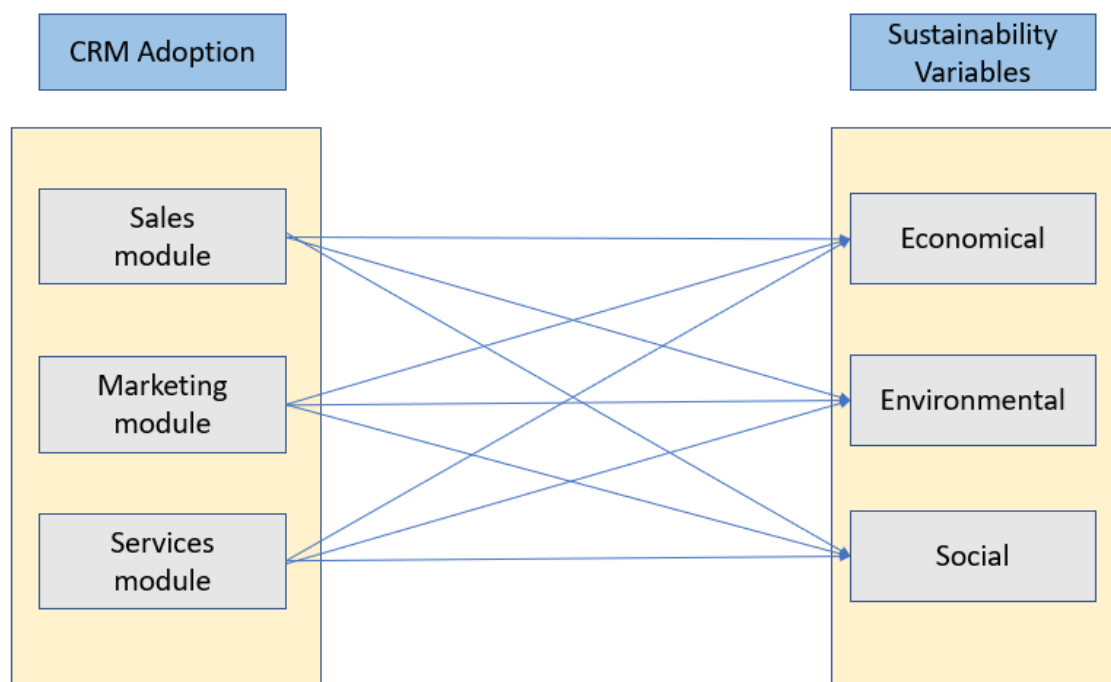
Figure 2. Proposed research model

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 **9** different **hypotheses** dealing with core aspects of **business sustainability.**

Model Hypotheses

Below are the aforementioned 9 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 et al., 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 et al. (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 organizations' ecological responsibilities (Chen et al., 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 centralization 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 et al. (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 center 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 et al. (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 organizational 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 fulfillment 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 standardized, 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.

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Capítulo 5 : Research model for measuring the impact of Customer Relationship Management (CRM) on performance indicators.

Resumen del Artículo 4: "Research model for measuring the impact of Customer Relationship Management (CRM) on performance indicators".

Con este artículo se alcanza el primer paso para la validación empírica de la relevancia del uso de los sistemas CRM sobre la mejora de desempeño organizacional en las empresas, y con ello sobre los resultados empresariales. Una vez desarrollado el marco conceptual (en los artículos 1 y 2 de la tesis, correspondientes con los capítulos 2 y 3 respectivamente), y planteado el mapa de beneficios esperados (en el capítulo anterior, en el presente capítulo se ha desarrollado y orquestado el modelo de investigación propuesto para validar el impacto de uso de CRM sobre el desempeño organizacional, a través de la innovación como variable intermedia.

Este modelo incluye variables, ítems y escalas de medida validadas en algunos modelos anteriores, pero en este caso, fueron estructurados de manera diferente y con aportes de varias fuentes distintas, lo que lo hace novedoso y válido a la vez. Es válido porque en sus partes constituyentes se ha corroborado en entornos específicos donde se aplicaron por separado en estudios previos. Es novedoso porque incorpora diferentes módulos que nunca antes se habían relacionado entre sí a través de variables recogidas de diferentes entornos de estudio y que ahora se presentan en un nuevo modelo conjunto.

Del análisis de estudios previos, se concluye que es de esperar que las empresas que estén utilizando CRM de manera efectiva para gestionar sus relaciones con los clientes a través de los tres módulos de CRM (ventas, marketing, servicios y atención al cliente), obtengan mejoras en su desempeño organizacional. Esto no siempre está totalmente probado debido al diferente grado de uso de CRM que cada empresa puede estar llevando a cabo y por ello se ha considerado tan importante agregar una variable independiente denominada "Prácticas CRM" que se refiere al grado de uso que cada empresa hace del sistema CRM una vez implementado.

Por otro lado, y tal y como los capítulos anteriores han venido mostrando, las estrategias de innovación son clave en la búsqueda de resultados sostenibles y duraderos en el tiempo, por lo que se ha considerado su papel relevante como variable intermedia e influenciadora del impacto del uso de CRM sobre el desempeño organizacional.

La variable dependiente y objetivo en sí mismo elegida para construir el modelo de investigación ha sido el desempeño organizacional. Este objetivo, en sí mismo, ya indica una mejora relevante para las empresas, ya que hace referencia a toda mejora en el rendimiento de los procesos y herramientas de gestión claves para la empresa. De forma indirecta, y como factor clave para la misión de toda empresa, este objetivo también es esperable que impacte en la mejora de los resultados empresariales. De todo ello se concluye que el desempeño organizacional puede ser aceptado razonablemente como un buen parámetro de estudio del impacto del uso de cualquier herramienta de gestión empresarial, como así se ha hecho en la creación del presente modelo de investigación.

La originalidad y valor de este nuevo modelo de investigación radica en que está preparado para ser utilizado en diferentes entornos, con la esperanza de validar cómo y en qué medida cada uno de los ítems del constructo de "Prácticas CRM" impacta en los ítems del constructo final (desempeño organizacional) y el constructo intermedio (capacidad de innovación), y está abierto a cualquier sector o grupo de empresas cotizadas. Se trata de un modelo de investigación global y general preparado para ser adaptado y utilizado en cualquier caso y circunstancia. Como

futuras líneas de investigación, se propone establecer canales de adaptación del modelo de investigación y el cuestionario de validación, en función de los sectores o circunstancias del estudio, adoptando variables o componentes adicionales en función de los requisitos validados por la revisión ambiental.

En el siguiente y último artículo de la tesis, en base a los constructos e ítems planteados en este modelo, se procede a validar (en un sector productivo concreto, en este caso el de la producción y distribución de vinos en España) cuáles son las condiciones que hacen que efectivamente haya mejoras en el desempeño organizacional como consecuencia del uso de CRM y combinado con el uso de estrategias de innovación.

Datos de publicación del Artículo 4: "Research model for measuring the impact of Customer Relationship Management (CRM) on performance indicators".

Los autores de este artículo son Vicente Guerola Navarro, Raul Oltra Badenes, Hermenegildo Gil Gómez , y Jose Antonio Gil Gomez.

Los datos de publicación más relevantes:

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- ➢ Índices de impacto:
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    - o SJR: percentil 67, con posición 208/637 en 2019, con índice de impacto de 0.490
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Los temas sobre los que esta revista presta mayor atención son: emprendiduría, economía del desarrollo, teoría económica, Innovación y conocimiento, metodología de investigación económica, sostenibilidad, desafíos para la ciencia económica, y economía del desarrollo.

Economic Research-Ekonomska Istraživanja es una publicación científica en el área de las ciencias sociales, que está indexada en el índice internacional *Journal Citations Report*, más conocido como índice **JCR**, en el área de "ECONOMICS", con un factor de impacto de 2.229, siendo su factor de impacto 2,167 en los últimos 5 años. Con ello, en 2019 la revista se sitúa en el segundo cuartil (Q2) de su categoría dentro del índice JCR.

Economic Research-Ekonomska Istraživanja también está indexada en el índice *SCImago Journal and Country Rank*, conocido como **SJR**, en el área Economics, Econometrics and Finance: Economics and Econometrics, con un índice de impacto de 0.490, situándose en el percentil 67 (ocupando la posición 208 dentro del ranking de las 637 primeras) de este índice internacional.

Finalmente, esta revista aparece indexada en el índice *Source Normalized Impact per Paper*, conocido como **SNIP**. En este caso, SNIP mide las citas reales recibidas en relación con las citas

esperadas para el campo temático en cuestión, y en este caso tiene un índice de impacto SNIP de 1.226 en 2019.

Este artículo es la base para la validación empírica de los conocimientos adquiridos en las etapas previas. Tras haber detectado cuales eran los parámetros más influyentes y representativos en los estudios previos sobre los sistemas CRM, y haber planteado una hipótesis sobre los beneficios esperados del uso de tales soluciones tecnológicas de gestión, se ha aplicado todos estos conceptos y condicionantes en la construcción de un modelo general de investigación que relacione el uso de CRM con la obtención de mejoras en el desempeño organizacional, y ello usando como variable intermedia e influente la capacidad de innovación.

Se ha construido un modelo con tres variables (Practicas de CRM, Innovación, y Desempeño Organizacional), con sus respectivos constructos y elementos, relacionados a través de tres hipótesis de trabajo que deberán ser validadas en cualquier estudio empírico que use dicho modelo.

También se ha elaborado un cuestionario, en base a dichos constructos y elementos, y compuesto por bloques previamente validados y aprobados por la comunidad científica, para la recogida de información en la muestra de entidades a las que se dirija el proceso de validación empírica en cada caso.

Este capítulo da paso al último artículo de la tesis, en el que se usan estos constructos, elementos, y cuestionario, para validar empíricamente las condiciones que hacen efectiva la mejora en el desempeño organizacional cuando se usa CRM y estrategias de innovación, todo ello aplicado al sector de la producción y distribución de vinos en España.

Title: Research model for measuring the impact of Customer Relationship Management (CRM) on performance indicators.

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Keywords

Customer Relationship Management; CRM; CRM Practices; Customer Knowledge Management; Innovation Capability; Firm Performance.

Abstract

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

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

1.- Introduction

Customer Relationship Management (CRM) is a technological solution that emerged in the 1970s as a tool for companies to automate the management of the company's internal sales

force (Buttle, 2004). It has experienced an exponential growth since 2010 in terms of its deployment in companies in all sectors and in terms of interest as a focus of scientific research (Guerola-Navarro et al., 2020a; Guerola-Navarro et al., 2020b; Gil-Gomez et al., 2020). In line with the initial approach of CRM as a basic sales force management tool, Chen and Popovich (2003) defined CRM as an integration of processes, human capital and technology seeking the best possible understanding of a company's customers. The CRM technology solution has evolved from a basic initial approach to a global vision of integral management of information about customer knowledge in order to achieve more effective customer interaction (King & Burgess, 2007). CRM's current approach as a business management tool is to establish channels and methods to manage customer centred information to improve organizational performance and thereby obtain better business results (Guerola-Navarro et al., 2020b; Gil-Gomez et al., 2020).

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

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

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

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

2.- Literature review

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

CRM object and scope

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

Due to its direct action on management processes in the areas of sales, marketing and services, CRM provides direct benefits both in terms of economic performance and commercial activity in general, as well as global business profitability. The improvement in customer knowledge management generates a better customer experience and therefore greater customer satisfaction, which has a positive effect on the results and profitability of the company (Scullin et al., 2002), obtaining the following beneficial consequences: greater customer loyalty; a more effective marketing strategy; better customer service and support; greater efficiency and cost

reduction. These benefits associated with the use of CRM are those that would justify the impact we want to measure in this paper through a research model.

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

CRM innovation capability

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

The capacity for innovation is considered a valuable key organizational resource to increase and maintain a competitive advantage (Hult and Ketchen, 2001), which is decisive for the company's business success through the continuous search for Customer loyalty. Panayides (2006) highlights innovation capability as the most efficient channel to sustain and gain competitive advantage. Shane and Ulrich (2004) identify the importance of innovation capability in today's modern, dynamic market, where highly unpredictable, changing customer needs can only be met by successful companies through product and service innovation.

Fidel et al. (2018) consider that innovation processes are the most important element for an innovative system. Innovation is the key factor for successful companies to improve their organizational performance by encouraging them to create, evaluate and develop innovative and useful products, services and practices, thus creating and retaining value for internal and

external stakeholders, and generating new channels of income (Dervitsiotis, 2010). Innovation capability is an especially critical success factor for small and medium-sized enterprises, due to the fierce competition in the modern market with larger firms (Gallego et al., 2013).

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

CRM customer knowledge management

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

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

Modern marketing theories are based on relational marketing, marketing efforts to develop and strengthen long-term relationships with customers, all enhanced through commercial efforts and energies that have been channelled into the continuous improvement of customer service, which has a high impact on customer satisfaction. (Garbarino and Johnson, 1999). The current highly globalized market demands that leading companies take on new competitive challenges, for which it is essential to put the maximum focus and effort into the management of customer relationships, and especially into customer satisfaction as the main way to survive and maximize income, this being a point key in the CRM objective and scope as a technical business management solution (Constantinos et al., 2003). This customer-centred marketing orientation, at the heart of relational marketing, is directly related to the expected benefits of the deployment and use of CRM in companies (Bose, 2002).

CRM has become the key software technology tool for leading companies to track and analyse customer-related information, trusting that their customer relationships can be greatly improved through the use of information technology and technology management solutions. (Karimi et al., 2001). The use of CRM to adapt the productive efforts of the companies to the needs and particularities of the client is therefore key (Dewhurst et al., 1999), based on the principle that the knowledge of the needs and expectations of the clients is the basis of efficient knowledge management. CRM has become a privileged management tool focused on the

identification, attraction, development and retention of successful customer relationships, with the final objective of increasing the loyalty of profitable customers, all carried out through efficient customer knowledge management (Bradshaw and Brash, 2001; Massey et al. , 2001). Therefore, looking at the close relationship between CRM and customer knowledge management as key factor for a successful business management strategy, it can be concluded that CRM can definitely be considered to be relevant as a firm performance influencer (Constantinos et al., 2003; Romano, 2000; Massey et al., 2001).

Research models to measure the impact of using CRM

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

Valmohammadi (2017) presented a research model to empirically test a framework that identifies the relationships between **CRM practices** (independent variable), **organizational performance** (dependent final variable) and **innovation capability** (dependent intermediate variable), in this case focused on 211 Iranian manufacturing companies using structural equation modelling. This study concludes that the use of CRM in manufacturing companies has a positive, significant, although weak, effect on organizational performance and innovation capacity. The results also show that a significant improvement in organizational performance is achieved as a consequence of the improvement in innovation due to CRM. Valmohammadi (2017) considered **innovation** to be a key factor of business success, seeing this as the ability to be flexible and to have a great capacity to adapt to changes in the market. Innovation has been defined as the generation, acceptance and implementation of new ideas, processes, products and services (Thompson, 1965). According to Chandler et al. (1998) innovation capability can be defined as the potential ability of an organization to position itself in an area of advancements resulting in a competitive advantage over its rivals. Lin et al. (2010) linked the use of CRM to the development of innovation capability. Regarding **organizational performance**, Valmohammadi (2017) considered it to be a measure of how well an organization achieves its market-oriented and financial goals (Li et al., 2006). There are several indicators included in the literature for measuring organizational performance: return on assets, return on investment and profit margin on sales, sales growth, market share, market share growth, customer satisfaction and overall profitability (Sin et al., 2005; Li et al., 2006; Akroush et al., 2011; Narasimhan et al., 2008; Keramati et al., 2010; Battor and Battor, 2010). The **research model** from Valmohammadi (2017) validated the influence that CRM practices of manufacturing needs have on organizational performance and on innovation capabilities. A survey instrument was developed to test the research model, where the items and questions in the questionnaire related to CRM practices were adopted from the studies of Lin et al. (2010) and Akroush et al. (2011), while items measuring innovation capabilities were adopted from Chong et al. (2011), and items measuring organizational performance used in reviewed literature (Sin et al., 2005; Akroush et al., 2011; Keramati et al., 2010; Battor and Battor, 2010).

Li et al. (2019) propose a new model for CRM value according to Information Technology and Information Systems usage theory and "two-stage model." The empirical analysis was performed using the Harte – Hanks CI Technology Database, Compustat, and ACSI as data sources, specifically for the years 2001 to 2008, accessing information from Fortune 1000 companies in the United States of America, specifically on CRM usage and other metrics on the general use of Information Technology. The final study consisted of 387 samples of which the

corresponding customer satisfaction scores, the annual financial figures and stock performance were studied. The research model included an independent variable (**CRM Usage**), two intermediate measuring variables (**Operational Benefits** and **Strategic Benefits**), a final measuring variable (**Firm Performance**), and two moderating variables (**Firm Size** and **Product Differentiation**). Six research hypotheses were established. The empirical tests carried out in the study concluded that the operational benefits of CRM were reflected in the high income of the companies per employee, which led to high profitability. CRM's strategic benefits are reflected in the high customer satisfaction of the companies, which leads to high profitability and market valuation. The study also concluded that the size of the company positively moderates the operational and strategic benefits of CRM, while the level of differentiation of industry products negatively moderates the operational and strategic benefits of CRM.

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

Kebede and Tegegne (2018) studied the effects of CRM practices on the performance of commercial banks in the Amhara region, Ethiopia. The objective of the study was to demonstrate that the bank's performance and the level of its organizational performance could be improved by improving the level of customer satisfaction, which could be achieved by implementing and using CRM efficiently. The dimensions used in the study were Key Customer Focus, Knowledge Management, CRM organization and Technology-Based CRM. The factors used in the study as determinants in bank performance were Key Customer Focus, CRM organization, Knowledge Management and Technology-Based CRM. The study implemented a binary logistics regression model to analyze the effect of these factors on the bank's performance, concluding that customer knowledge management is the key factor that influences the bank's endorsement.

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

predictability of earnings. Other results tested as positive and derived from the use of CRM were increases in sales and cash flows, a reduction in operating margin, a reduction in the provision for doubtful accounts, and more accurate administration earnings forecasts.

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

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

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

3.- Methodology

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

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

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

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

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

4.- Results

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

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

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

CRM Practices

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

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

CRM, since they focus on knowing how many implementations are made in a period of time and region, regardless of the level of introduction. Finally, Azad and Ahmadi (2015) also consider the assessment of the degree of introduction and use of CRM as a starting point to assess its impact on performance.

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

CRM innovation capability

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

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

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

CRM Firm performance

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

In the reviewed models, though with different nomenclatures, the final objective is to measure the impact that the use of CRM has on the metrics that evaluate the organizational performance of the companies in a certain sector and geographic area. This impact is measured in different

models through different variables, and with different meters, but all these variables and meters are closely related. Valmohammadi (2017) calls this concept of impact on results "Organizational Performance", as does Kebede and Tegegne (2018), a concept comparable to what Li et al. (2019) called "Firm Performance". Reinartz et al. (2004) uses the "Economic Performance" concept. Haislip and Richardson (2017) use a selection of performance variables.

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

Research model and Hypothesis

The existing research models in the scientific literature were reviewed, and it was verified that the most relevant variables that were globally represented in the study of the impact of the use of CRM on business performance were "CRM Practices", "Innovation capability" and "Firm Performance". The proposal in this paper is to use the conceptual research model in Figure 1 as a methodology to study the impact of CRM use.
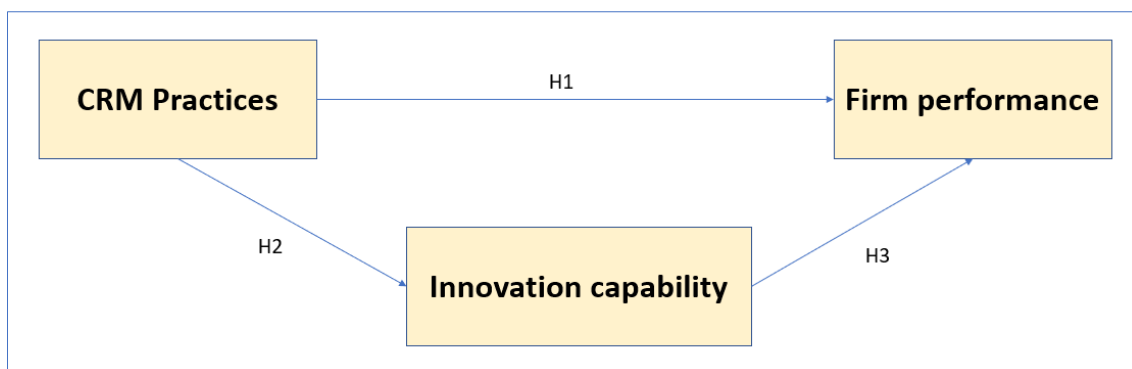

Figure 4. Conceptual research model for CRM impact on Firm Performance

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

H1. CRM practices have a significant and positive impact on firm performance.
Romano (2000) states that CRM was conceived and enhanced during its development, with the main, global objective of attracting and retaining economically valuable clients, for which its working power lies in identifying and separating less profitable customers, which positions CRM in line with modern customer-centric business management theory (Sin et al., 2005). This suggests, and should be demonstrated by validating this hypothesis, that its ability to analyze and plan sales, marketing and services strategies will lead the company to obtain and maintain long-term partnerships, and thereby improve firm performance. Joo (2007) considers that a client-centred approach is the key to business success, since the dynamism of the modern market demands a high business capacity to adapt to the environment, which is the assumption that CRM provides. Again, it is expected, through the validation of this hypothesis, that CRM can

lead to better customer knowledge management, and thereby create long-term partnerships and achieve maximum customer-loyalty (Huang & Lin, 2005). The originality of this work is that it not only tests the hypothesis that CRM has an impact on firm performance, but that through this hypothesis it links firm performance (Nakata et al., 2008) to the degree of introduction of CRM or CRM Practices (Valmohammadi, 2017).

H2. CRM practices have a significant and positive impact on Innovation Capability.
Innovation has been defined as a set of ideas, practices or objects perceived as innovative by an individual or a group of people (Fruhling and Siau, 2007; Hsu, 2006). More specifically, in this study, innovation capacity refers to the application of technology in an organization to develop pioneer systems, policies, products, processes, devices and services (Chang and Lee, 2008; Damanpour and Evan, 1984). Considering the topic of business management solutions that concern us in this paper (specifically CRM) it can also be said that these capabilities also integrate the ability of a company to assimilate and use external data to obtain commercial knowledge and information oriented to success (Cohen and Levinthal, 1990). In today's modern, changing, dynamic market, innovative capacity is vital to enhance the competitive advantage of companies (Hult and Ketchen, 2001) and is essential for business success. The needs of customers, unpredictable and changing, can only be met through innovation (Shane and Ulrich, 2004). With this hypothesis, we want to demonstrate that indeed, and intimately linked to the degree of introduction of CRM (referred to in our model as "CRM Practices", there is a significant and positive impact due to the use of CRM in the degree of innovation of the company. Jen et al. (2010) already predicted a differential impact related to CRM in each innovation capacity, which we intend to demonstrate with our research model.

H3. Innovative Capability has a significant and positive impact on firm performance.
The capacity for innovation is a particularly critical success factor for small and medium enterprises, due to fierce competition with larger companies in the modern market (Gallego et al., 2013). It has been mentioned in this paper that the implementation and power of innovation processes are the most important element for a successful company (Fidel et al., 2018; Ru - Jen et al., 2010; Ramani and Kumar, 2008; Sahay and Ranjan, 2008). Innovation is expected to be one of the key factors for successful companies to improve their performance by encouraging them to create, evaluate and develop innovative and useful products, services and practices, enhancing the long-term partnership with interesting agents for the business of the company (Dervitsiotis, 2010). It is intended with this hypothesis to demonstrate that the capacity that CRM has to help the company obtain, manage, and efficiently exploit customer knowledge (its needs and preferences), definitely and positively has an impact on the performance of the firm.

Measures and construct validation

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

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

- Information sharing

- Customer involvement

- Long-term partnership

- Joint problem-solving

- Technology-based CRM

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

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

- Our company frequently tries out new ideas

- Our company seeks new ways to do things

- Our company is creative in its methods of operation

- Our company is often the first to market with new products and services

- Innovation in our company is perceived as too risky and is resisted

- Our new product introduction has increased over the last 5 years

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

Regarding the construct of **Firm Performance**, there is much published literature on constructs and validated items in more specific studies and also in more general ones. Dawes (1999) and later Zegarra (2014) based on Dawes (1999), analyse and study different subjective measurements of organizational performance in market-oriented studies. After reviewing the literature, the construct and the items chosen by Zegarra (2014) are the same that we chose, as

the approach is comparable to that of our study, and it is the one proposed by Nakata et al. (2008). The Nakata et al. (2008) scale uses subjective measures to measure organizational performance. The scale compares the performance of the organization with that of other competitors and is composed of the following items:

- The quality of the product or service.

- The success of new products or services.

- The customer retention rate.

- The level of sales.

- The return on capital.

- Gross profit margin.

- The return on investment

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

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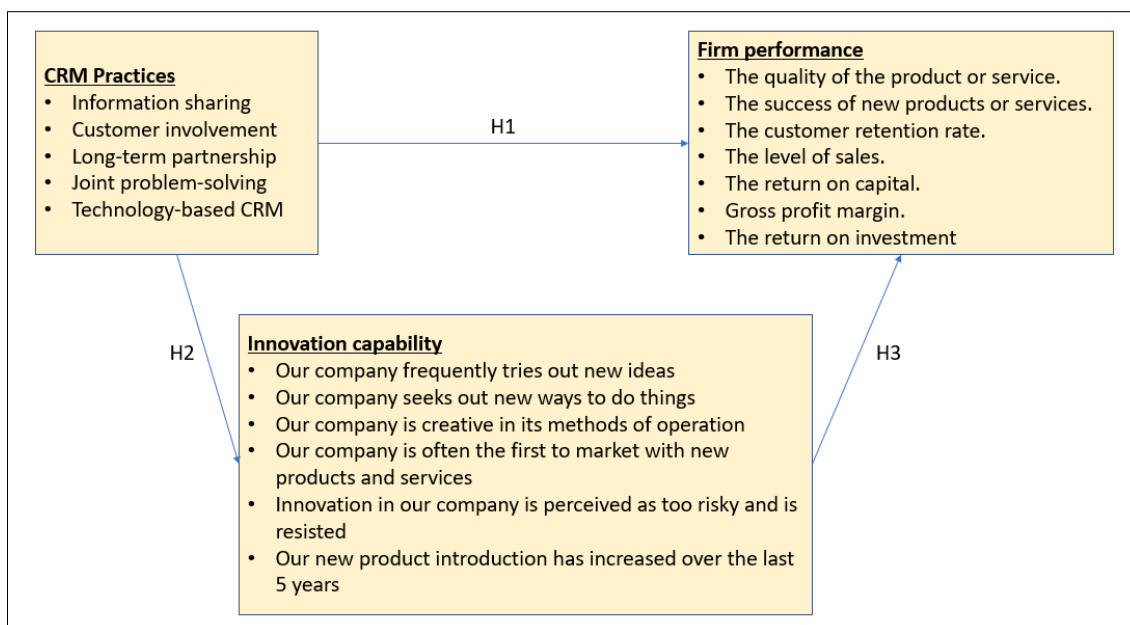

Figure 5. Research model for CRM impact on Firm Performance

With the proposed model, based on constructs and items validated by different previous studies, the next step proposed in this paper is to determine the research methodology. The final purpose will be to establish, together with the research model, a research methodology

that permits testing the model in different productive sectors, geographical areas, and groupings of companies, and thereby draw conclusions about the impact on firm performance that the implementation and use of CRM in the companies may have, all this in function of the degree of introduction of CRM in these firms.

Research methodology

Hernández Sampieri et al. (1996) define two types of approach as to the possible way to face the study and testing of a research model: a quantitative approach and a qualitative approach. Hernández Sampieri et al. (1996) define the "**quantitative** approach" as one that uses data collection to test hypotheses based on numerical measurement and statistical analysis, in order to establish behavioural patterns and test theories; on the other hand, it also defines the "**qualitative** approach" as one that uses data collection and analysis to refine research questions and reveal new questions in the interpretation process. Both approaches employ careful, methodical, empirical processes in their effort to generate knowledge, so the previous definition of research applies to both equally. However, although quantitative and qualitative approaches share these general strategies, each has its own particular characteristics. Finally, there are "**mixed** approaches", in which evidence from numerical, verbal, textual, visual, symbolic and other data is used to understand problems in science. Deciding what the study approach will be in each case will depend on the approach of the problem and the circumstances surrounding it, as well as the recommendations of the precedents of studies in the same field (Hernández Sampieri et al., 1996).

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

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

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

Results

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

Based on similar previous studies on the measurement of the impact on organizational performance that the use of the CRM technological solution may have, and also based on modern considerations derived from studies on innovation capacity, customer knowledge

management, a research model was proposed with global characteristics of general applicability to almost any productive environment, as was the main initial objective of this study.

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

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

5.- Conclusions

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

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

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

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

Regarding limitations, the proposed research model and questionnaire aims to be general and open to any sector, so it could be expanded and adapted in each case depending on any

particular circumstances. It is fully accepted that there are additional factors such as the associated risks and transaction costs that may influence the evaluation of firm performance.

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Appendix

Questionnaire used to validate the research model.

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

Gender: □ Male   □ Female

Age: □ 25 to 35 years   □ 35 to 45 years   □ more than 46 years

Education level: □ Primary   □ Secondary   □ University/High School

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

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

Number of employees: □ 1 to 10   □ 11 to 50   □ 51 to 250   □ more than 250

Annual Billing (million €):   □ 0 to 1   □ 1 to 10   □ more than 10

Property Structure: □ family   □ group   □ multinational □ others

3.- **CRM Practices**. Please indicate the degree of agreement or disagreement with the following statements regarding the situation of your company:

- If you totally agree, select 5.
- If you agree, select 4.
- If you feel neutral, select 3.
- If you disagree, select 2.
- If you strongly disagree, dial 1.

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

4.- **Innovation Capability**. Please indicate the degree of agreement or disagreement with the following statements regarding the situation of your company:

- If you totally agree, select 5.
- If you agree, select 4.
- If you feel neutral, select 3.
- If you disagree, select 2.
- If you strongly disagree, dial 1.

Innovation Capability	1	2	3	4	5
4.1.- The organization usually generates new ideas.					
4.2.- Our company looks for new ways of doing things.					
4.3.- The company is creative in its methods of operation.					

4.4.- Our company is usually the first to introduce new products and services to the market.					
4.5.- Innovation in our company is perceived as a very risky activity.					
4.6.- The introduction of new products has increased in the last 5 years.					

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

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

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

Capítulo 6 : Customer relationship management (CRM) and Innovation: A qualitative comparative analysis (QCA) in the search for improvements on the firm performance in winery sector.

Guerola-Navarro, V., Oltra-Badenes, R., Gil-Gomez, H., & Iturricha Fernández, A. (In press). Customer relationship management (CRM) and Innovation: A qualitative comparative analysis (QCA) in the search for improvements on the firm performance in winery sector. *Technological Forecasting & Social Change*.

Resumen del Artículo 5: "Customer relationship management (CRM) and Innovation: A qualitative comparative analysis (QCA) in the search for improvements on the firm performance in winery".

Tras construir, en el capítulo anterior, un nuevo y original modelo de investigación (con sus variables, constructos, elementos e hipótesis), en este último capítulo de la tesis doctoral se ha acometido un proceso de validación de la hipótesis inicial sobre la relación de impacto entre el uso de los sistemas de CRM y la mejora en el desempeño organizacional de la empresa que lo usa.

Con el afán de que la tesis doctoral tuviera un espíritu práctico y aplicado, se ha analizado las características de las empresas típicas en España, que como se preveía ha resultado ser pequeñas y medianas empresas (PYMES). Pretendido pues que el estudio fuera lo más representativo posible para el mercado español, se ha seleccionado un sector copado por empresas de este tipo (PYMES), y más incluso de carácter familiar (característica también muy típica en nuestro tejido productivo), y que gozara de una imagen nacional e internacional reconocida y valorada. El sector elegido ha sido el de la producción y distribución de vinos, las bodegas con razón social en España. Se ha aprovechado en este proceso de selección la experiencia profesional previa del autor de la tesis, con una amplia experiencia en la gestión de sistemas CRM y con una relación muy estrecha con proveedores de Tecnologías de Información y Comunicación (TIC) especializados en proveer servicios a este tipo de empresas.

El presente estudio ha tratado de encontrar la relación causal de necesidad y suficiencia de ciertas condiciones, generalmente aceptadas en la literatura como relevantes para el estudio de la solución de gestión empresarial CRM, con el resultado esperado de desempeño organizacional perseguido por toda empresa que implementa y utilizar este sistema de gestión. Para realizar este estudio empírico, se ha tomado como elementos básicos las variables (y sus elementos) identificados en el proceso de construcción del modelo de investigación del capítulo anterior. También se ha utilizado el cuestionario que se había creado en dicho capítulo, puesto que contiene un bloque por cada una de las variables usadas en nuestro proceso de validación empírica. La metodología empleada para realizar este estudio ha sido fsQCA (*fuzzy set qualitative comparative analysis*). La metodología de análisis fsQCA se utiliza para analizar el efecto combinado de variables en un resultado, como se ha justificado y desarrollado en este capítulo.

De la realización de este estudio se ha obtenido varias conclusiones:

- La primera conclusión que se extrae es que no surge ninguna condición *necesaria* (relativa al uso de CRM e innovación) para que exista un buen desempeño organizacional. Del mismo modo, no parece ser *necesaria* ninguna condición para que no se produzca dicha mejora en el desempeño organizacional. Esto deja un amplio abanico de posibilidades para encontrar caminos que sean al menos suficientes en la búsqueda de mejoras en el desempeño.
- Sí que se concluye, en segundo lugar, que para que exista un buen desempeño organizacional, con un alto grado de consistencia y cobertura en los casos analizados, debe haber un uso intensivo de la tecnología CRM o una buena cultura de gestión de relaciones con el cliente.

- Respecto a las condiciones de suficiencia, aparece como necesario a la vez tener una buena cultura de Gestión de la Relación con el Cliente, una buena estrategia de Innovación de Procesos y una buena estrategia de Innovación de Producto. Esta es la receta mágica que ofrece el análisis fsQCA como condición que, sin mayores condicionantes, conduciría a la obtención del resultado deseado (un buen desempeño de la empresa).

- Existe otro camino de suficiencia para conseguir un buen desempeño, que requiere que la empresa utilice CRM de manera intensiva junto con una buena cultura de Gestión de la Relación con el Cliente, pero no requiere que haya Innovación en Productos. Este segundo camino también es suficiente, pero tiene menos consistencia y menor cobertura (explica menos casos empíricos) que el anterior.

Analizando todas las conclusiones obtenidas, y como conclusión general, el estudio muestra que, en la muestra analizada y con las condiciones planteadas, en un mercado dinámico y cambiante donde las estrategias centradas en el cliente son clave para tener éxito comercial, la gestión de la relación con el cliente es clave tanto desde el punto de vista cultural (mediante estrategias de *Customer Relationship Management*) como desde el punto de vista tecnológico (mediante el uso de soluciones tecnológicas de gestión CRM).

Datos de publicación del Artículo 5: "Customer relationship management (CRM) and Innovation: A qualitative comparative analysis (QCA) in the search for improvements on the firm performance in winery".

Los autores de este artículo son Vicente Guerola Navarro, Raul Oltra Badenes, Hermenegildo Gil Gómez , y Agustín Iturricha Fernández.

Los datos de publicación más relevantes:

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> ➢ Índices de impacto:
>> ○ JCR: 1er Cuartil, con factor de impacto 5.846 (en 2019). En los últimos 5 años factor de impacto 5.179
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La revista *Technological Forecasting and Social Change* tiene como objetivo ser un gran foro para quienes deseen abordar directamente la metodología y práctica de la predicción tecnológica y los estudios de futuro como herramientas de planificación ya que interrelacionan factores sociales, ambientales y tecnológicos.

Technological Forecasting and Social Change es una publicación científica en el área de las ciencias sociales, que está indexada en el índice internacional *Journal Citations Report*, más conocido como índice **JCR**, en el área de "BUSINESS" y "PLANNING & DEVELOPMENT", con un factor de impacto de 5.846, siendo su factor de impacto 5.179 en los últimos 5 años. Con ello, en 2019 la revista se sitúa en el primer cuartil (Q1) de su categoría dentro del índice JCR.

Technological Forecasting and Social Change también está indexada en el índice *SCImago Journal and Country Rank*, conocido como **SJR**, con un índice de impacto de 1.815, situándose en el percentil 96 (ocupando la posición 16 dentro del ranking de las 394 primeras) en el área de "*Business and International Management*", y en el percentil 94 (ocupando la posición 12 dentro del ranking de las 227 primeras) en el área de "*Applied Psychology*".

Finalmente, esta revista aparece indexada en el índice *Source Normalized Impact per Paper*, conocido como **SNIP**. En este caso, SNIP mide las citas reales recibidas en relación con las citas esperadas para el campo temático en cuestión, y en este caso tiene un índice de impacto SNIP de 2.617en 2019.

Con este artículo concluye el trabajo de investigación, habiendo dado respuesta a los objetivos planteados inicialmente, y concluyendo que efectivamente el uso de los sistemas de gestión empresarial como CRM son claves en la obtención de mejoras en el desempeño organizacional, con la consiguiente expectativa de que ello redunde en la mejora de resultados empresariales.

Artículo 5: "Customer relationship management (CRM) and Innovation: A qualitative comparative analysis (QCA) in the search for improvements on the firm performance in winery".

Customer relationship management (CRM) and Innovation: A qualitative comparative analysis (QCA) in the search for improvements on the firm performance in winery sector

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Customer Relationship Management; CRM; Firm Performance; Innovation; Winery; QCA.

Abstract

The main objective of modern Information Technology (IT) is to convert the transactional data derived from productive activity into business management information. It should, therefore, provide the Business Decision Makers (BDM) elaborate, meaningful and essential information for decision making. Customer Relationship Management (CRM) is one of the IT areas that has grown the most in interest and development during recent decades, due to the potential that

CRM offers its users to have a global vision of their clients and to put them at the center of their business efforts .

Given the potential that the CRM technological solution offers to successful companies in the business world, this study determined the necessary and sufficient conditions to obtain good firm performance (the outcome) when CRM is implemented and used in a company. For this purpose, the Qualitative Comparative Analysis (QCA) methodology was used. The empirical test was carried out in the sector of wine production and distribution in Spain.

1.- Introduction

One of the most important differential values in companies that survive in an increasingly dynamic and competitive market today is their capacity for innovation and adaptation to the environment (Dew et al., 2011; AlQershi et al., 2020). Technology is one of the basic pillars that allows companies to face their challenges in the field of innovation, both in products and in processes (Nambisan et al., 2017). The increasing variability and demand due to the expectations of customers, who are part of a society that has increasingly greater and better access to information, imposes the need to face digital transformation in entrepreneurial companies (Kane et al., 2015) and to have the most appropriate management information to meet such customer demands, so one of the technological areas in which it is most important to be up-to-date is that of business management systems. In the search for the most efficient management systems that allow companies to successfully face their digital transformation processes, CRM emerges (together with ERP systems) as one of the business solutions with the greatest impact and relevance today (Saura et al., 2019a ;Heavin & Power, 2018).

The fairly widespread perception that small and medium-sized enterprises (SMEs) have a lower level of digitization suggests that sectors with smaller, more family-run companies are where the greatest difficulties can be found in facing the challenge of process digitization (Müller et al., 2018; Saura et al., 2019b). However, the very weakness of size in this aspect can be transformed into a virtue if its greater flexibility is taken into account to face innovation and change in its procedures. The wine production and distribution sector in Spain fits perfectly into this typology of SMEs with difficulties in facing digital transformation, in addition to being one of the most representative of the national economy and of the national tradition. These are the two main reasons why this study was carried out in the Spanish winery sector.

There is not a wide background in the literature covering the use and impact of Information Technology (IT) in the winery sector, raising the question about why this sector does not arouse interest in studying the impact of the use of new technologies and therefore becoming in a very interesting development opportunity. Searching for published information on CRM and the wine industry yields even fewer results. In none of the studies published on CRM and the wine sector are the most relevant conditions analyzed that can be postulated as necessary and sufficient for there to be good performance in companies that use CRM intensively, which is the main objective of this study. In the search for evidence that digital transformation can help SMEs to successfully face their challenges related to innovation and adaptation to the economic and social environment, the main objective of this study is to analyze the conditions and requirements that can make use of CRM systems leading to firm performance improvements in

the Spanish winery sector, SMEs and family-run companies being its main representative typology of companies. Digital transformation, in which important tools such as ERP, CRM, and Social Media participate, appear as the keys to the development of a sustainable business for any productive sector (Oltra-Badenes et al., 2019; Vicedo et al., 2020 ; Reyes-Menendez et al., 2020; Saura et al., 2020)

To achieve this objective, this paper begins by defining the theoretical framework on which to work, both from the point of view of the sector under study (that of the production and distribution of wines in Spain) and from the point of view of the technological solution on which the study is based (the CRM systems and the main dimensions that identify it). The next stage is the definition of the database used, as well as the selection process of the representative sample of the population. The methodology used for the empirical validation of the conditionality relationship (need and / or sufficiency) between the main variables that define the chosen research model is described below. Finally, the results are presented, as well as a discussion about them and the conclusions obtained.

2.- Literature Review & Related Work

2.1.- The wine sector in Spain.

The aggregate economic dimensions of the wine sector in Spain justify the development of this empirical study in this sector. In Spain there is a stable number of wineries that fluctuates every year around 4.300 wineries, specifically 4.373 wineries in Spain at the end of 2018 (Tecnovino, 2018), with a tendency to continue growing in the coming years. This is confirmed by the Spanish Wine Market Observatory (OeMv), that reports the increase in the number of wineries in Spain in 2018 to a total of 4.373 wineries, that represent 280 more than in 2017 (OEMV, 2018). These are data as of January 1st 2018, provided by the Central Business Directory (DIRCE) of the INE. This includes large groups of winemakers, family wineries and medium-sized wineries (the volume is calculated based on the kilos of grapes and liters handled, rather than the number of employees or billing). The value of the production of the wine and must sector, according to the estimation of the Agricultural Income of 2019, has grown by 26% compared to the previous year, amounting to 2,142.8 million Euros (estimate in current values at basic prices), contributing 8.02% of Vegetable Production and almost 4.8% of Agricultural Branch Production. The workforce that generates the cultivation of the vineyard has close to 18 million workers (MAPA, 2020). Statistical data from the Ministry of Agriculture, Fisheries and Food (MAPA) states that in Spain the area planted by vineyards according to data from the Viticultural Registry of each autonomous region as of July 31st 2019 amounts to 957,573 hectares. The production of wine and must in Spain is characterized by its great variability from one campaign to another due to the strong dependence of the crop on weather conditions. Thus, the average of the last five campaigns (2008/2009 to 2012/2013) reached 38.6 million hl.. In recent years, crops ranging from 21 million hectoliters in the 1994 campaign can be found, until the production of the current campaign that will be a record production.

In any study on the sector of wineries in Spain, it is essential to understand the concept of "Protected Designation of Origin" (PDO) that makes any study carried out in this sector especially relevant. CECRV (2020) says that the PDO were born to differentiate wines of recognized prestige. PDO is a quality brand that accompanies all companies and products in the sector where the objective of quality and satisfaction to the Customer is essential. Currently, in Spain there are 70 PDOs related to wines (among the 95 Spanish protected designations of

origin).On the other hand, a Denomination of Origin (DO) is a concept that identifies a product originating in a particular place, whose quality or characteristics are fundamentally or exclusively due to a particular geographical environment, with the natural and human factors inherent to it, and whose production phases take place entirely in the defined geographical area.

2.1.1- CRM and winery sector

The large winery groups in Spain usually have technological departments that develop their technology from the manufacturer's core. They generally have agreements with IT technology companies and develop joint plans in which both parties benefit. Often, they depend on large investment groups, groups of companies in the food sector, and multinational groups. On the other hand, the majority of wineries are family-run and do not require a large amount technology, because there are very few employees and the management processes are simple. They usually work with basic accounting and billing programs and some field application or warehouse management, which when they fall short of functionality are replaced by integrated management systems such as Enterprise Resource Planning (ERP) or Customer Relationship Management (CRM).

The current reports certify that the majority of Spanish wineries are Small and Medium Enterprises (SME), in many cases family-run businesses (MAPA, 2020; OEMV, 2018), and have difficulty in facing the challenge of digital transformation and the adoption of modern business management technologies, such as Enterprise Resource Planning (ERP) and Customer Relationship Management (CRM).

2.1.2.- Previous studies on wine sector

There are very interesting previous studies on the effect of using CRM and even more concretely some variants or components of CRM such as Social Web communication. Iazzi et al. (2013) observe and analyze the contributions made by social media in redefining firm-client relations in the wine sector as a support for CRM systems. This study analyzes the emerging trends in the use of Web tools in the wine sector, identifying the main purchase determinants that lead the choice process of consumers and developing new guidelines for the effective implementation of the instruments observed. This will help companies to better manage the social media communication tools called sCRM applications as well as their related marketing strategies.

Belias et al. (2018) review from a critical point of view the existing literature about the impact of using CRM in the wine, winery, and wine tourism sectors, concluding that there is still a long way to go before having a clear picture of the benefits that the use of CRM is expected to bring to these sectors. The hints reflected in the existing studies about CRM impact on firm performance, together with the ones referring to the winery sector's modernization, predict a clear positive expectation about the impact of using CRM on firm performance indicators, but there are still no concrete studies about it. It is interesting to note that this study is focused on the **Greek tourism wine sector**.

Crescimanno et al. (2017) conducted another local investigation related to the wine sector and IT, specifically reviewing the impact of Social Media (SM) on the **Italian wine sector**. In this case the study shows the clear effects of SM on the corporate image and the customer relationship management developed through all the company's departments and statements. In this case the CRM technological solution is not the protagonist, nor the study focus, but it seems to show an interesting way for further investigation and research.

Ferrer-Lorenzo et al. (2017) conducted a specific **Spanish wine sector** study, examining the firm's performance differences. In this case the core of the research line comes with the differences between business groups and independent companies, pointing out the impact of size and structure differences. One of the conclusions refers to the more complex and conscious way that big companies use for driving customer centered marketing strategies, always through customer relationship management strategies, but not always through CRM technological solutions. The objective of the business groups using modern knowledge management technologies is frequently to share common information.

Table 1 shows the different studies where the wine sector is linked directly to the use of IT solutions.

Author	Research
Iazzi et al. (2013)	Impact of the use of Social Web Communication and CRM in the marketing strategies of wine enterprises.
Belias et al. (2018)	Literature review about the expected impact of using CRM in Greek tourism wine sector.
Crescimanno et al. (2017)	Study on the impact of Social Media (SM) on the Italian wine sector.
Ferrer-Lorenzo et al. (2017)	Study on the different impact of using CRM culture (not CRM technology-based solutions) in Spanish wine companies

Table 7. Similar research. Source: the authors.

2.2.- Relevance of CRM as a modern business technological solution

The first indications of the CRM technological solution appear in the 1970s, in its beginnings being a clearly and exclusively focused solution for the automation of the sales force (Buttle, 2004). The CRM management solution was initially composed of three modules: sales, marketing and services, which are the three classic axes of the global business management of customers (Chen & Popovich, 2003). In the current dynamic business world, the customer-centred approach is the key to business success (Joo, 2007), for which the use of CRM provides a key component to achieve customer loyalty and attain their trust (Huang & Lin, 2005). This technological solution is gradually expanding its scope of action, and always within its strategic customer-centered management approach, towards the field of marketing and customer service and support.

The bibliometric analysis of the CRM field of study using scientific research methodology, shows the relevance of CRM within the business field as a key solution for the success of business decision makers in the development of their daily functions (Araújo et al., 2018), as well as within the field of scientific research, has grown definitively from the year 2000, and in an exponential form from the year 2010 (Guerola-Navarro et al., 2020a). This quantitative approach to the CRM reality, together with the qualitative approach provided by an extended Literature Review (Guerola-Navarro et al., 2020b), provides a clear picture of CRM as a growing focus of scientific research, with a still not very abundant battery of reference studies, but with a continuously growing bibliography database that makes CRM one of the basic pillars of study in the field of the pursuit of business excellence through Customer-centered management strategies (Wahlberg et al., 2009).

The main strength of CRM as a business tool is the sustainable model of benefits that it provides to the companies that use it properly and intensively. Not only the present exploitation (through efficient customer knowledge management) of the tool for managing customer relationships, but also the exploration (through innovation capabilities) of new future benefits that provide the companies the opportunity to reach and maintain a long-term sustainable partnership with customers (Gil-Gomez et al., 2020).

2.3- CRM practices

Like any business management tool, CRM can be used to different degrees of intensity by its users, with different purposes as well as in different areas of functionality. A starting point in the analysis of the conditions that lead to CRM producing a good outcome (firm performance) is to have a way to establish the level of effective use of CRM in companies, which is known as "CRM Practices".

Recent studies have established different approaches for defining, measuring, and using the CRM degree of usage in the companies as a condition. Li et al. (2019) proposed a two-stage model for CRM value, with operational and strategic benefits and targeted firm performance, including an initial independent variable called "CRM Usage" in their model. One of the main conclusions from Li et al. (2019) is that Operational and strategic benefits of CRM usage improve firm performance. In this case, as per performing a quantitative analysis, CRM usage for a firm is calculated as the revenue-weighted average proportion of CRM use among all the subsidiaries of that firm. Kebede and Tegegne (2018) use the "CRM Practices" concept to identify the degree of CRM usage, defining CRM Practices as: Key Customer Focus, Knowledge Management, CRM organization and Technology-Based CRM.

In previous studies, Reinartz et al. (2004) consider the degree of use of CRM through three stages or dimensions: relationship initiation, relationship maintenance, and relationship termination. The vision of the use of CRM by Reinartz et al. (2004) is therefore to establish what influence CRM has in each temporal phase of the development of the relationship with the client. It is not an approach that quantifies or values the degree of use, but the use phase of CRM. Azad and Ahmadi (2015) define five elements influencing CRM use and its impact: customer relationship technologies, customer oriented, enterprise development strategies, customer services and business plan.

In a very recent research model, Valmohammadi (2017) highlights the importance of the degree of use of CRM in the measurement of its impact on business results. Valmohammadi (2017) uses five elements for measuring the level of use that any company may have:

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

With the appropriate scale, these five elements provide a clear picture of how much the CRM tool capabilities are being used by the companies (Valmohammadi, 2017). This modern, current approach is the one that comes closest to the planning of the study of the conditions of use of CRM in the empirical environment in which this study was developed, as accepted by some recent study models (Guerola-Navarro et al ., 2020c) and which is therefore the one used for the current empirical study.

2.4.- Innovation

Pisano (2015) highlights the innovation strategy as one of the key drivers for leading and sustaining performance, giving sense to some efforts such as R&D teams, internal entrepreneurship ventures, pursuing external alliances, collaborating with customers and implementing rapid prototyping. Technological innovation appears as a huge creator of added value and as a driver of competitive advantage, making innovation strategy one of the pillars for any study on the conditions for obtaining acceptable firm performance (Alonso & Bressan, 2014). Pisano (2015) also highlights the choice that every company has to make when creating an innovation strategy: how much to focus on technological innovation and how much to invest in business model innovation. In the present study both the technological and the business model strategy were considered in the selection of conditions.

Previous studies showed that innovative companies have some common elements: management commitment to entrepreneurial activities and innovation; integration of talent in teams and task forces; group and collective orientation; and a reward system that reinforces entrepreneurial behavior (Saleh and Wang, 1993). Hurt et al., (1977), proposed a scale of measurement of the global capacity of innovation composed of twenty items leading to a strategic vision of innovation. This approach has been used massively in the literature (Hult, et al., 2004). Pearson (1990) describes a certain number of models for studying how innovation processes take part in entrepreneurship projects.

Regarding studies specifically focused on product innovation, Cooper and Edgett, S. J. (2010) present a framework for developing a product innovation strategy, defining innovation goals and objectives through to the selection of strategic arenas and the development of the strategic map. Product innovation strategy appears in this research paper as essential and strongly linked to positive performance, showing how important it is to consider product innovation as a condition for analyzing firm performance.

Cassiman and Veugelers (2006) link innovation to knowledge management and firm performance, stating the same hypothesis that the present study relies on. The use of both complementary views from CRM, future exploration through innovation together with present exploitation through customer knowledge management, should bring important opportunities for companies to improve their results (Gil-Gomez et al., 2020).

From another perspective, Calantone et al. (2002) developed a different scale for measuring the capacity of innovation, in this case composed of six more specific items. The items that make up the scale by Calantone et al. (2002) are:

- Our company frequently tries out new ideas,
- Our company seeks new ways to do things,

- Our company is creative in its methods of operation,
- Our company is often the first to market with new products and services,
- Innovation in our company is perceived as too risky and is resisted,
- Our new product introduction has increased over the last 5 years.

The scale from Calantone et al. (2002) and the proposal itself is one of the most cited and used in the literature. This article has been cited a total of 1,265 times to date (according to the Web of Science records), since its publication in 2002, which means it is cited more than 70 times each year. It also has 51 references cited. Besides, it appears in the Google Scholar database with 3.831 citations to date; which is why this scale was selected in the present paper to measure and define the relevance of Innovation elements to reach firm performance as a desired outcome.

2.5.- Firm Performance

Firm Performance represents the main objective for any strategy that any company can invest in. Any initiative that enterprises have both internally and externally must be clearly related to the main mission of the company, and it is intimately linked to firm performance.

Belderbos et al. (2004) relate innovation to firm performance, establishing that the different areas of innovation between different agents of the business asset management process are closely linked to the performance obtained in innovative companies. Bharadwaj et al. (1999) establish a strong link between Information technology (IT) and firm performance, in the same field in which this study is developed, concluding that IT definitely contributes to a firm's future performance potential.

In the search for firm performance measurement models that can be used in empirical test models, Bryant et al. (2004) use a global performance measurement system that tracks measures across four hierarchical perspectives: learning and growth, internal business processes, customers, and financial perspectives. Some more specific models such as Ng et al. (2009) link firm performance to the level of adverse selection, as characterized by the degree to which order flow moves prices, associating the firm performance measure to increases in future earnings volatility.

Dawes (1999) and Zegarra (2014) propose different subjective measurements of organizational performance in market-oriented studies. In the same line, the Nakata et al. (2008) scale uses subjective measures to measure organizational performance. The scale compares the performance of the organization to that of other competitors and is composed of the following items:

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

Nakata et al. (2008), despite its relatively recent publication in 2008, has 42 citations to date in the Scopus database, ranking in the 66th percentile. It also has 98 citations in the Google Scholar

database. The relevance of the study and measurement proposal of Nakata et al. (2008) means that in the present study its measurement scale is used to evaluate the firm performance factor.

3.- Conceptual framework

The main objective of this work is to verify the link between the use of CRM management technology solutions and the improvements obtained in organizational performance, including the deployment of business innovation strategies as an intermediate variable.

The literature review justifies taking the following hypotheses as a starting point. Previous studies suggest that the use of CRM technology-based solutions, as well as management based on the culture of customer relationship management, will have a positive impact on the results of the company. This impact is expected to occur as a consequence of the improvement in organizational performance that the use of CRM should induce. In the same way, it is also to be expected that the implementation of business strategies for innovation in products and processes, enhanced by an improved management of the information available to customers and their expectations (thanks to the use of CRM), ends up also generating improvements in organizational performance and therefore in business results. The starting hypotheses on which this study is based are therefore:

- the use of CRM (as a technology and as a culture) positively impacts organizational performance.
- the deployment of innovation strategies in processes and products has a positive impact on organizational performance.

These expectations, due to the nature of their variables and dimensions, can be raised as generally valid starting hypotheses. As the main objective of the work, this empirical study aims to demonstrate whether this link between CRM and Innovation with Organizational Performance is confirmed in the specific case of the wine production and distribution sector in Spain. The objective is twofold:

- From an academic point of view, we intend to demonstrate this link empirically, as it is theoretically expected to happen.
- From a practical point of view, we intend to confirm in a practical and definitive way whether it is interesting for companies in the sector under study to invest in CRM management systems and in Innovation strategies.

The research questions that we intend to resolve in this study are, based on the hypotheses of the impact of CRM and Innovation on organizational performance, the conditions of need and sufficiency that accompany these links between the main variables of the study. The main objective of studying the impact of the use of CRM and innovation strategies on organizational performance, is therefore broken down into analyzing:

- what conditions of use of CRM and the deployment of innovative strategies are necessary for there to be effective improvements in organizational performance?
  - in isolation, with CRM and Innovation
  - crosswise, jointly CRM and Innovation

- what conditions of use of CRM and the deployment of innovative strategies are sufficient for there to be effective improvements in organizational performance?
  - in isolation, with CRM and Innovation
  - crosswise, jointly CRM and Innovation

Obtaining the matrix of conditions of need and sufficiency, involving the two starting variables (CRM and Innovation), which lead to the achievement of the final objective (obtaining improvements in organizational performance), is therefore the global objective of this research.

4.- Methodology and sample

4.1.- Data and sample selection

In order to validate the research model of impact measurement on the performance of a select and important group of companies based on the degree of introduction of CRM, the present study investigated which is the most representative segment within the wineries of Spain.

4.1.1.- Selection of the database of companies for the study

The selection criterion to obtain the company database as the object of study was to choose from the **2.575 Spanish companies registered in the National Statistics Institute (INE) with the code CNAE-1102** (corresponding to the heading "Winemaking"), selecting those that invoice at least 2 million Euros annually. This criterion was chosen to have a sufficient number of study elements, that are representative of the sector, and that are not only the ten largest wine corporations (with more than 10 million Euros annual turnover) represented by multinational groups that are not a reflection of the national reality of wine production. This database was obtained from the Axesor (2019) report, as of 10/01/2019 with the public data of the Commercial Registry obtaining **a total of 418 companies above 2 million Euros of annual invoicing**. Looking into the companies below 2 million annual turnover, the ICT adoption ratio falls exponentially, which confirms that the chosen criteria were accurate.

Of these 418 companies, all of them with their corporate name located in Spain, dedicated to the production of wine (with CNAE-code "1102"), and with more than 2 million Euros in turnover, the ones that have implemented and are using some type of CRM system were selected. The process of obtaining information on the use of a CRM system (guessing if the companies are or not using any kind of CRM) was carried out through individual calls to the 418 companies. As a result of these calls, a list of **84 companies** was obtained **(from the initial 418) that have some type of CRM in use and in production**.

Inspecting and carefully analyzing the list of 84 companies, it is observed that 10 of them belong to business groups that direct their management strategies, so it was considered appropriate to eliminate these 10 companies (which do not have decision-making or management capacity on CRM) from the list of targeted companies, thus leaving a definitive **list of 74 companies as the target selected list of companies for the study of the impact of the use of CRM on firm performance**.

The data filtering chain, according to these criteria, is shown in Table 2.

Criteria	CNAE-1102 in Spain	More than 2 million Euros annual invoicing	Using CRM	Not belonging a business group
Sample size (number of companies)	2.575	418	84	**74**

Table 8. Sample size for empirical study. Source: the authors.

4.1.2.- Taxonomy of the database of companies for the study

In a first and basic analysis of the database under study, some first findings were obtained in terms of classification by basic factors (Guerola-Navarro et al., 2020d).

Spanish companies in the wine production sector that have recognized that they are using some type of CRM as a management solution, represent 20.10% of the total number of wineries with an annual **turnover** of more than 2 million euros. In absolute terms, two thirds of the companies in the sector that use CRM have a turnover level of between 2 and 10 million Euros. The billing range in which the highest percentage of these companies have CRM is between 10 and 50 million Euros per year, where just over one in three companies (37.84%) uses CRM.

Among the **CRM solutions manufacturers**, there is a clear leadership of WOLF-CRM within the companies in the sector, with 41.27% of the total. It is followed by the CRM module of Dynamics NAV (9.52%) and the CRM module of SAP (9.52%); between the three they reach a market share of 60.32%.

Regarding the **number of employees**, 75% of all these companies that use CRM are small (less than 50 employees). The segment with the highest penetration is therefore the Medium-sized company.

The last classification criterion used is that of **geographical distribution**. This sector has very specific characteristics by geographical area, with protected management through Protected Designations of Origin (DPO) and differentiated characteristics of the product for each area and DPO (CECRV, 2020). Most of the DPOs are linked to geographical areas, so it is considered interesting to also classify the number of companies that use CRM according to the geographical area to which they belong. In this sense, Asturias has a 100% penetration rate (the only company in the sample located there uses CRM). Basque Country, Murcia, Catalonia, Aragón, Castilla León, Madrid and Galicia appear with between 20% and 30% of their companies using CRM. Finally, the Valencian Region, Andalusia, Navarra, La Rioja and Castilla La Mancha have between 10% and 20% of their companies using CRM.

4.2.- Methodology: fuzzy-set qualitative comparative analysis (fsQCA)

In order to find the necessary and / or sufficient conditions for an outcome to occur, the fuzzy set qualitative comparative analysis (fsQCA) was used in this paper. fsQCA is used to analyze the combined effect of variables on an outcome. fsQCA has been applied to different fields of research such as innovation, regional competitiveness and university-business relations

(Álvarez-Coque et al., 2017; Nieto Alemán et al., 21018; Garcia-Alvarez-Coque et al., 2020; Berné-Martínez et al., 2020). A condition is sufficient when its mere presence serves to cause the outcome under study, without the need for any other condition. If there is some combination of conditions that can explain the existence of the same outcome, this phenomenon is called multicausality (Ragin, 2009). On the other hand, a condition is necessary if this condition is present whenever the result occurs. In these terms, the methodology FsQCA identifies all combinations of conditions that cause the same outcome (Roig-Tierno, 2017).

The QCA methodology was chosen because, within the environment available for the study of the impact of the use of CRM and innovation on the improvement of business results, it offers the possibility of qualitatively analyzing which are the ingredients and paths that can lead to these conditions auguring a good outcome for the company that decides to implement them as management systems and as strategies.

FsQCA is one of the fastest growing analysis methodologies in recent years (Berger, 2016). It was created by Charles Ragin (Ragin, 2009), and has three variants: csQCA, mvQCA, and fsQCA, with fsQCA (fuzzy-set qualitative comparative analysis) being the most complete (Ragin, 2008). fsQCA is based on set theory and Boolean logic, relies on qualitative evidence, and allows for multiple conjoint causality (Ragin, 2009).

In order to perform a fsQCA analysis, there are some common steps to follow (Schneider and Wagemann, 2012; Garcia-Alvarez-Coque et al., 2019):

1. Identify the **sample of relevant cases**: in our case we have a **74 enterprise sample**, to which we sent a questionnaire (Guerola-Navarro et al., 2020c), obtaining **26 final answers**, that were analyzed with fsQCA.
2. Identify a list of **causal conditions and the outcome**: the present study constructed the conditions based in the variables and elements identified in Guerola-Navarro et al. (2020c):
    a. Conditions: **CRM Practices**, **Innovation**,
    b. Outcome: **Firm Performance**.
3. **Calibrate** the conditions and the outcome. Calibrating means identifying whether a condition is present or absent by assigning a value between 0 and 1. The results of the responses to the questionnaire were transformed into a fuzzy set data, in this case (according to FsQCA methodology) into continuous values ranging from 0 (fully out) to 1 (fully in). The direct calibration method was chosen (Ragin, 2009), in which:
    a. the value **0 is assigned to denote the absence of the condition**,
    b. **1 is assigned to denote presence**
    c. and **0.5 is assigned to denote the point of maximum ambiguity**.
4. Generate the **Truth Table**, containing all the logically possible combinations of available conditions. The number of rows for the table is 2^k where k is the number of conditions, including the "logical reminders" (logically possible combinations that do not appear in our list of cases).
5. The **truth table is reduced** using the R Package from Medzihorsky et al. (2016). Depending on how we decide to deal with the logical remainders there are three different solutions: parsimonious, complex and intermediate, all compatible with each other.

6. Among the parameters, two main indicators were evaluated. A minimum level of both measures is required to accept a solution as valid (Ragin, 2009):
   a. The **coverage** of a configuration refers to the percentage of cases that can be explained by that configuration.
   b. **Consistency** reflects the degree of membership of a condition to a configuration.

Having introduced the fsQCA methodology, in the next sections the elements used in the present study are explained.

4.3.1.- Conditions

Guerola-Navarro et al. (2020c) identify two large variables (CRM Practices and Innovation), and an output (Firm Performance) with their elements. As shown in Figure 1, this approach fits the theoretical framework that covers the present study, so the following step was to convert these variables into conditions for fsQCA analysis (Ragin, 2014). Conditions are those elements that are used to study the presence/absence and the impact as necessary/sufficient for the outcome to occur.
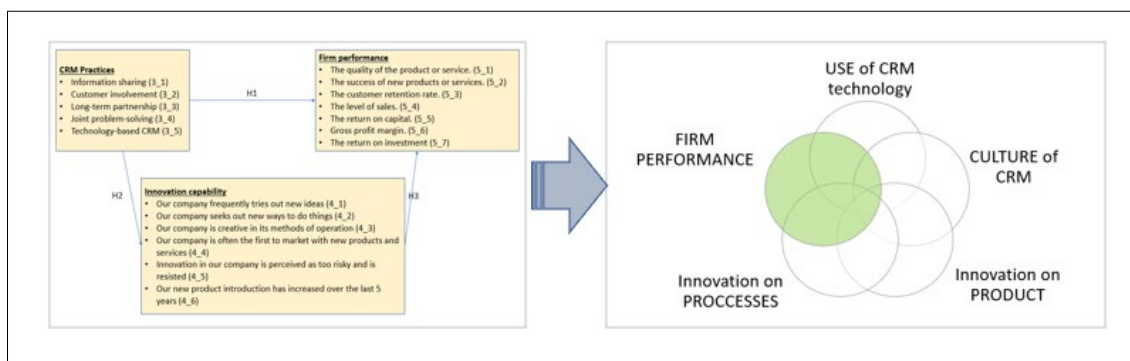

Figure 6. Adaptation from Guerola-Navarro et al. (2020c) Research model based on conditions for fsQCA analysis. Source: The authors.

The final objective of the present study is to analyze which conditions are necessary and/or sufficient for the output (Firm Performance) to occur.

The Conditions used for this study were:

- Culture of Customer Relationship Management
- Use of CRM Technology
- Innovation on Processes
- Innovation on Product

In the next sections, the composition of each of these conditions is explained.

3.3.1.1.- Culture of Customer Relationship Management

The Culture of Customer Relationship Management refers to any concept, strategy, or activity directly related to good customer relationship management. This condition is composed of the elements (the code between brackets comes from the questionnaire from Guerola-Navarro et al., 2020c):

- Information sharing (3_1): actively share relevant information with customers
- Customer involvement (3_2): encourage the active participation of customers in all the processes that concern them
- Long-term partnership (3_3): cementing the durability of commercial and collaborative relationships with good clients
- Joint problem-solving (3_4): establish collaboration channels with customers for team resolution of problems and incidents in relationships with them

In our study it was assumed that for a good culture of Customer Relationship Management to exist, these four conditions must be met at the same time, so the relationship between them would be concurrency and therefore the values of the condition to be studied would be the same, resulting from multiplying its four components.

3.3.1.2.- Use of CRM Technology

Technology-based CRM refers to the effective and intensive use of any technological CRM business management solution from among those on the market, with the aim of managing customer relationships in the most efficient way. This condition is composed of the element (the code between brackets comes from the questionnaire from Guerola-Navarro et al., 2020c):

- Technology-based CRM (3_5): use of the selected software solution implemented in the company

This condition adds the use of this technology that automates and manages all relevant customer information to the Customer Relationship Management culture.

3.3.1.3.- Innovation on Processes

Innovation on Processes refers to all activities and strategies that the company puts into practice for the continuous improvement of internal processes, in the search for effectiveness and efficiency. This condition seems essential in a changing economic environment such as the current one, in which Innovation and Development policies are the key element in any attempt to stay in the market with the best practices. Its elements are (the code between brackets comes from the questionnaire from Guerola-Navarro et al., 2020c):

- Our company frequently tries out new ideas (4_1): refers to the company's ability to put process improvement ideas into practice
- Our company seeks out new ways to do things (4_2): it is often necessary to invent and develop new ways of doing things, not only when the previous ones have stopped working efficiently, but even when they are still bearing fruit.

- Our company is creative in its methods of operation (4_3): creativity is closely related to the development of new ways of doing things, and therefore to achieving process improvements

Again, it is assumed that the three conditions must be considered as concurrent if a broad and effective concept of Innovation on Processes is sought, so that the multiplication of its results will give an accurate measurement (Palacios-Marques et al., 2017).

3.3.1.4.- Innovation on Products

Innovation on Products includes the actions implemented to introduce significant improvements in the products, either in their functions, quality, properties, etc. This is a basic area so that the goods and services offered to the market continue to maintain the competitive advantage that means they are acquired rather than those of the competition. Its elements are (the code between brackets comes from the questionnaire from Guerola-Navarro et al., 2020c):

- Our company is often the first to market with new products and services (4_4): refers to the strategic option of the company to be the first to offer the market new products that meet the new needs raised by customers
- Innovation in our company is perceived as too risky and is resisted (4_5): directly related to the previous one, it shows the company's ability to take risks and overcome resistance to change when it comes to offering new things to the market before competitors
- Our new product introduction has increased over the last 5 years (4_6): together with the previous two, it represents the innovative impact, measured through the introduction of new products

As in the previous conditions, it was assumed that the three conditions should be considered as concurrent if a broad and effective concept of Innovation on Products is considered, therefore resorting to the multiplication of its elements in its quantitative measurement within our analysis (Palacios-Marques et al., 2017).

3.3.1.5.- Firm Performance

Firm Performance is the outcome that is intended to be evaluated, together with the previous conditions, to determine which paths and ingredients can lead to its obtainment. Its components are (the code between brackets comes from the questionnaire from Guerola-Navarro et al., 2020c):

- The quality of the product or service. (5_1): fruit of a good innovation and development strategy, and a necessary condition to maintain a competitive advantage in the market
- The success of new products or services. (5_2): needed for maintaining the level of interest from the customers
- The customer retention rate. (5_3): essential as a customer-loyalty indicator, and essential for maintaining a good level of sales with efficiency
- The level of sales. (5_4): the main objective when performing customer relationship management

- The return on capital. (5_5): the ratio that indicates that the global strategy on effectively managing the customer relationship is successful
- Gross profit margin. (5_6): complementary performance indicator to the return on capital and the return on investment
- The return on investment (5_7): complementary to the two previous ones, and directly related to concrete investment projects

The concurrence of all these elements, and therefore the multiplication of the values obtained in the empirical study (Palacios-Marques et al., 2017), were multiplied as in the previous conditions.

4.3.- Preparation and passing of questionnaires

To obtain information on the impact of using CRM, the questionnaire from (Guerola-Navarro et al., 2020c) was used. As part of a collaboration with the organizing committee of the WINETECH Forum 2020 business event (Winetech Forum, 2020), a personalized web communication was launched for the targeted companies under study, in which they were offered the possibility of collaborating in this study. They were asked to, anonymously, disinterestedly, and voluntarily, respond to the research model questionnaire, with the aim of obtaining objective results without a connection to any agent involved in the distribution or promotion of any type of CRM.

This web action was complemented with reinforcement calls, as well as reminders via email, in order to have as many answers as possible and thereby the best results for the investigation. In gratitude for this disinterested collaboration, the participating wineries were offered publicity in the results obtained, as a way to value the use of key business management tools in the wine production sector.

The way to answer the questionnaire was completely online, through a web-form provided by Microsoft Dynamics 365.

The questionnaire consists of a series of questions to be answered choosing responses evaluable between 1 and 5 points following a Likert scale (Albaum, 1997). This questionnaire has 5 areas, each one focused on one aspect, the sections being relevant for our study:

- Section 3 - degree of use of CRM or "CRM Practices"
- Section 4 - Innovation
- Section 5 - Firm Performance.

The results obtained after sending the questionnaire to the sample firms, were analyzed and the results are shown in the following section.

4.4.- Data and calibration

The 74 companies that made up the sample and which were therefore the object of analysis, were asked to collaborate in responding to the questionnaire, finally obtaining 26 responses, which represents a 35% response rate. The questionnaire and the study were presented as anonymous, but with the possibility for the respondent to identify himself if he so desired in order to have a means of contact in case of wanting to analyze a case in depth or as a case study.

First, and to begin the study, the description of the sources and the conditions and results are reflected in Table 3.

Outcome/Conditions	Description	Source and Year
PERF (Outcome)	FIRM PERFORMANCE	Declarative statement from the head of the company (answers to questionnaire in August 2020)
CRM_CULT	CULTURE of CRM	
CRM_TEC	USE of CRM technology	
IN_PROC	Innovation on PROCCESSES	
IN_PROD	Innovation on PRODUCT	

Table 9. Description and data sources

The responses to the questionnaire used the 5-point Likert scale. In our study, all items were given a positive value, that is, 1 (strongly disagree) indicates the lowest value and 5 the highest value (strongly agree). These items were grouped into 4 conditions, using the multiplication of the elements to calculate the specific value of each factor (Palacios-Marques et al., 2017).

These conditions were then constructed on the basis of the answer to each question on the questionnaire as follows:

Outcome/Conditions	Construct
PERF (Outcome)	(5_1)*(5_2)*(5_3)* (5_4)* (5_5)*(5_6)*(5_7)
CRM_CULT	(3_1)*(3_2)*(3_3)* (3_4)
CRM_TEC	(3_5)
IN_PROC	(4_1)*(4_2)*(4_3)
IN_PROD	(4_4)*(4_5)*(4_6)

Table 10. Construct of each condition and outcome

Where the definition of each element provided from the questionnaire is included in the annex:

Group of dimensions	Definition of the elements
CRM Practices	• Information sharing (3_1) • Customer involvement (3_2) • Long-term partnership (3_3) • Joint problem-solving (3_4) • Technology-based CRM (3_5)
Innovation	• Our company frequently tries out new ideas (4_1) • Our company seeks out new ways to do things (4_2) • Our company is creative in its methods of operation (4_3) • Our company is often the first to market with new products and services (4_4) • Innovation in our company is perceived as too risky and is resisted (4_5) • Our new product introduction has increased over the last 5 years (4_6)
Firm Performance	• The quality of the product or service. (5_1) • The success of new products or services. (5_2) • The customer retention rate. (5_3) • The level of sales. (5_4) • The return on capital. (5_5)

	• Gross profit margin. (5_6)
	• The return on investment (5_7)

Table 11. Definition of the elements for the constructs

Secondly, the calibration was carried out as in Table 6, which shows the primary statistics and the cut-off points for the calibration of the conditions and the result, following the principles of direct calibration (Ragin, 2009). For the calibration and the remaining analyzes, the R package developed by Medzihorsky et al. (2016).

Outcome/Conditions	Fully in	Crossover point	Fully out	Max	Min	Mean (SD)
CRM_TEC (fs_TEC)	Dichotomous condition. Presence (1) or absence (0) of intensive use of CRM technology					
CRM_CULT (fs_CULT)	0.953	0.500	0.047	0.988	0.047	0.614 (0.240)
IN_PROC (fs_PROC)	0.953	0.500	0.047	0.953	0.038	0.489 (0.186)
IN_PROD (fs_PROD)	0.953	0.500	0.047	1.000	0.031	0.709 (0.681)
PERF (fs_PERF) (Outcome)	0.953	0.500	0.047	0.987	0.040	0.594 (0.428)

Note: the suffix 'fs_' denotes calibrated conditions or outcome

Table 12. Calibration of conditions and outcome

Based on the declarative responses of the heads of the companies to which the questionnaire was passed:

- the condition **CRM_TEC** were calibrated as *1 (presence)* and *0 (absence)* of intensive use of CRM technology in the enterprise.
- the conditions **CRM_CULT**, **IN_PROC**, **IN_PROD** and the Outcome **PERF** were calibrated as:
  - *Fully-in*: registries with values above the 90th percentile are "Fully-In"
  - *Crossover point*: median or 50th percentile, point of maximum ambiguity
  - *Fully-out*: registries with values below the 10th percentile are "Fully-Out"

After having calibrated the conditions and the outcome, the fsQCA analysis was performed with the results that are shown in the following section.

5.- Results and discussion

The present study, following the FsQCA methodology, tried to determine the necessary conditions and sufficient conditions, for companies that use CRM business management systems to obtain good firm performance. Also, taking into account the literature on QCA methodologies (Ragin, 2009), we tried to evaluate whether there is only one or more ways (equifinality) to reach the desired result (the "firm performance" outcome).

According to the conceptual framework and the reviewed literature, the following conditions were identified as relevant:

- CRM_TEC: internal intensive use of CRM technological solutions for the management of customer relationships
- CRM_CULT: existence in the company of a culture of customer relationship management, assumed and internalized by all members of the company
- IN_PROC: existence of a consistent innovation strategy in terms of the processes and activities that are developed in the company in search of the best practices to adapt to a changing and dynamic environment that requires constant dedication to modern activities.
- IN_PROD: ability of the company to generate and launch new goods and services on the market at the right time and in the right way to maintain a competitive advantage, and to maintain and improve its position in the Market

The intended outcome of the study is to discern what in the world of business reality defines which strategies are acceptable and which are not, in this case firm performance.

Both the conditions and the outcome were measured through the parameter elements that the literature proposes (Guerola-Navarro et al., 2020c), through presenting a questionnaire to the companies that are in the sample. These are therefore declarative values by the participants of this independent study, which must be taken into account as both an advantage and a limitation of the study.

5.1.- Individual necessary conditions

The first analysis carried out tried to find out if there are any of the conditions that, individually, are necessary for the company to have good Firm Performance. For a condition to be considered necessary, its consistency must be greater than 0.9 (Ragin, 2009). The result of the analysis can be seen in Table 7.

Conditions	fs_PERF			~ fs_PERF	
	Consistency	Coverage		Consistency	Coverage
CRM_TEC (fs_TEC)	0.650	0.655		0.348	0.345
~ CRM_TEC (~fs_TEC)	0.350	0.353		0.652	0.647
CRM_CULT (fs_CULT)	0.714	0.701		0.515	0.497
~ CRM_CULT (~fs_CULT)	0.488	0.506		0.690	0.704
IN_PROC (fs_PROC)	0.665	0.717		0.476	0.504
~ IN_PROC (~fs_PROC)	0.540	0.512		0.732	0.683
IN_PROD (fs_PROD)	0.706	0.641		0.607	0.541
~ IN_PROD (~fs_PROD)	0.495	0.561		0.598	0.667
Note: (~) denotes the absence of the condition; the suffix 'fs_' denotes calibrated conditions or outcome					

Table 13. Analysis of necessary conditions

From the analysis of necessity, **no condition emerges as necessary for good firm performance**. In the same reciprocal way, there is **no necessary condition for not having good firm performance**.

In the search for logical combinations of conditions that can give a conclusive result about their need in obtaining the outcome (firm performance) or the negation of the outcome, the combinations in Table 8 were checked.

Conditions	fs_PERF			~ fs_PERF	
	Consistency	Coverage		Consistency	Coverage
fs_TEC+fs_CULT	0.916	0.636		N/A	N/A
fs_PROC+fs_PROD	0.808	0.596		N/A	N/A
~fs_TEC+~fs_CULT	N/A	N/A		0.877	0.609
~fs_PROC+~fs_PROD	N/A	N/A		0.888	0.667
Note: (~) denotes the absence of the condition; the suffix 'fs_' denotes calibrated conditions or outcome					

Table 14. Analysis of necessary combination of conditions

Looking at these results and leaving aside those that are not logically interesting (N / A), we obtain a combination of conditions whose consistency is greater than 0.9, specifically "fs_TEC + fs_CULT", with a coverage of 0.636. This means that **the "OR" combination of both conditions is necessary for the outcome** to occur: "with a level of probability greater than 90%, for a company to have good firm performance, it is necessary to have an intensive use of technology (fs_TEC) or a culture of customer relationship management (fs_CULT), covering 63.6% of the cases in the sample with this statement ".

The second combination of conditions that appears as necessary in Table 8 is that of "fs_PROC + fs_PROD", which has a lower consistency than the previous one (0.808 of this one compared to 0.916 of the previous one) and a coverage also less than the previous one (covers 59.6% of cases instead of 63.6% covered by the previous one). This second combination indicates that another way to achieve firm performance requires product innovation or process innovation. The fact that the consistency and coverage values are lower than the previous ones, gives greater relevance to CRM conditions than to innovation conditions.

The rest of the combinations are not conclusive about their need, although looking at the option "~ fs_PROC + ~ fs_PROD" it can be concluded that with almost a 90% (88.8%) probability, for there to be no good commercial results (~ fs_PERF), it is necessary that there is no innovation in the processes (~ fs_PROC) or there is no innovation in the products (~ fs_PROD), 66.7% of the sample cases being covered by this statement.

In the same way and as an alternative path with slightly less consistency (0.877 of this one versus 0.888 of the previous one), for there to be no good commercial results (~ fs_PERF), it is necessary that there is no use of any CRM technologial solution (~ fs_TEC) or there is no culture of customer relationship management (~ fs_CULT), 60.9% of the sample cases being covered by this statement

5.2.- Analysis of sufficiency

The next step in our study was to find out which recipes, strategies, or paths lead to a good Firm Performance according to the proposed model and the results obtained in the field study of the wine production and distribution companies.

For this purpose, first the "Truth Table" was built, observing the case distribution, identifying contradictory configurations and identifying logical remainders (logical combinations of conditions that do not appear with empirical cases).

Secondly the sufficiency analysis was carried out, deleting the inexistent configurations, indicating which configurations generate the result, and proceeding with the analysis. Among the three possible approaches to sufficiency analysis, the maximum parsimony is chosen (Medzihorsky et al., 2016), which minimizes combinations assuming that all cases without empirical cases produce the result (includes logical remainders).

In our case, Table 9 was built with the results.

	Firm Performance (PERF)	
	Path 1	Path 2
CRM technology-based intensive use (**CRM_TEC**)	●	
Culture of Customer Relationship Management (**CRM_CULT**)	●	●
Active strategies of Innovation on Processes (**IN_PROC**)		●
Active strategies of Innovation on Products **(IN_PROD)**	○	●
Consistency	0.870	0.881
Raw coverage	0.211	0.487
Unique coverage	0.084	0.359
Overall solution consistency	0.862	
Overall solution coverage	0.571	

Note: As in Fiss (2011), ● means presence of the condition and ○ means absence of the condition; Algorithm: Quine-McCluskey; Consistency cutoff: 0.824027; Frequency cutoff: 1.00; Calculated as per Medzihorsky et al. (2016); Analysis of the absence of the outcome was performed but has not been included in the paper.

Table 15. Analysis of sufficient conditions for presence of PERF (firm performance): Parsimonious solution

Although some authors consider coherence values greater than 0.75 as acceptable, other authors propose more demanding parameters and raise it to 0.8 to be acceptable (Crilly 2011; Fiss 2011). This consistency scale of 0.8 was exceeded by the model (Overall solution consistency of 0.862) and by the two paths obtained to reach the desired outcome (path 1 with consistency of 0.870, and path 2 with consistency 0.881).

On the other hand, coverage indicates empirical relevance, so greater coverage implies a greater empirical relevance of the solution (Crilly 2011; Ragin, 2009), which means that a greater number of empirical cases are covered.

Different Consistency cutoff alternatives were tested, as well as global approaches (complex, intermediate and maximum parsimony solution), but none of these alternative approaches provided more significant solutions than the one described.

Table 9 finally shows the successful pathways to reach a good level of firm performance. Analyzing the table, the sufficient configuration "**(CRM_CULT) * (IN_PROC) * (IN_PROD)**" appears in Path 2 as the "**magic recipe**" for a good firm performance. Its interpretation is that as a sufficient condition to obtain good firm performance, it is necessary at the same time to have a good Customer Relationship Management culture, a good Process Innovation strategy, and a good Product Innovation strategy. This path shows a consistency of 0.881 (which is much higher than the cutoff of 0.8) and a coverage of 0.487 (which indicates that 48.7% of the cases are covered with this path). Process Innovation does not appear in this path, but in no case does this mean that it is not good to have a good Process Innovation policy, but that it is not shown as enforceable if this combination of conditions occurs to reach the outcome (firm performance).

The other combination of conditions proposed, path1 with "(CRM_TEC) * (CRM_CULT) * (~ IN_PROD)" represents another sufficient pathway that requires the company to use CRM intensively along with a good Customer Relationship Management culture, but does not require that there is Innovation in Products. This path has a slightly lower consistency (0.870) than the magic recipe, and a coverage of 0.221 which indicates that it covers only about half of the cases covered by the magic recipe. The fact that, in this proposal, Product Innovation is not a required condition, does not imply that it is not good in general to have a good Product innovation policy, it simply indicates that in this model it is not a significantly necessary condition. From another point of view, this result highlights the relevance of the other conditions (using CRM technology or having a good culture of customer relationship management), which make us assume, according to this, that with good use of CRM as a technology or as a culture it would not be necessary to innovate.

6.- Conclusions

The present study tried to find the necessary and / or sufficient causal relationship of certain conditions, generally accepted in the literature as relevant for the study of the CRM business management solution, with the intended outcome of Firm Performance pursued by every company that implements and uses this management system.

The first conclusion drawn is that no condition emerges as necessary for there to be good firm performance. In the same way, no condition appears to be necessary for such firm performance to not occur. This leaves a wide range of possibilities to find paths that are at least sufficient.

Third, looking for an alternative of necessity through the combination of conditions, it is concluded that with a high degree of consistency and coverage, for there to be good firm performance in the company, there must be an intensive use of CRM technology or a good culture of customer relationship management.

Fourth, analyzing the truth table and reviewing the sufficiency analysis, a sufficient condition for obtaining good firm performance, it is necessary at the same time to have a good Customer Relationship Management culture, a good Process Innovation strategy, and a good Product Innovation strategy. This is the magic recipe offered by the fsQCA analysis as the condition that, without further qualification, would lead to obtaining the desired outcome (good firm performance).

Fifth, there is another sufficient pathway that requires the company to use CRM intensively along with a good Customer Relationship Management culture but does not require that there is Innovation in Products, in order to reach the outcome (firm performance). This second path is also sufficient, but it has less consistency and less coverage (it explains fewer empirical cases) than the previous one.

All of the above, both from the point of view of need and sufficiency, gives CRM a significant and decisive relevance: on the one hand, the conditions of combined need ("or" options) include both the use of the CRM technology and the culture of customer relationship management, and on the other hand both pathways of sufficiency include the culture of customer relationship management and one of the pathways also adds the use of CRM technology. This definitely shows that in a dynamic and changing market where customer-centered strategies are essential

to obtain business success, customer relationship management is key both from a cultural point of view and from a technological point of view.

This study has several limitations that must be taken into account when interpreting the results. The first limitation is that the declarative statement of the people who responded to the questionnaire was accepted as valid, with the bias that this may introduce into the study. Second, the criterion of the multiplication of values was accepted in the analysis of grouped conditions, which is commonly accepted in the literature but has an alternative that is the sum of them (the test was carried out and the results differ in a way that is not very relevant with respect to those of multiplication).

As a general conclusion, the study obtained confirmation that a good culture of customer relationship management is key to having a good business result or firm performance, since it is in line with modern relationship marketing theories that focus on customer-centered management. To this relevance of the customer-centered management culture, it is added that the use of CRM technologies can and should help improve firm performance. Even more essential than the use of CRM technology, the study shows that innovation in processes is directly related to the company's ability to adapt to the environment (basically, the use of CRM technology is basic to attaining the management information that must be provided, so it is indirectly assumed that CRM technology has a great impact on firm performance).

An appropriate innovation and development strategy therefore appears to be essential, together with the culture of customer relationship management, to obtain good firm performance for companies that today want to maintain their competitive advantage in a changing and dynamic market environment.

6.1.- Managerial implication

From the results obtained, and their discussion, some valuable conclusions were obtained for business decision makers.

On one hand, having concluded that a good culture of customer relationship management is essential to have good business results or firm performance, company managers should seriously consider the option of implementing strategies aimed at managing information about their customers in the most efficient way. Completely in line with the theories of customer-centered management, this study clearly supports the culture of customer relationship management as a key element for successful business management.

On the other hand, considering the use of CRM technology-based solutions, as well as integral innovation strategies; it is concluded in this study that they are very valuable companions of the culture of customer relationship management if we want to ensure good organizational performance and good business results. Again, at this point, business decision makers should take this circumstance into account when deciding whether or not it is necessary to implement not only a good CRM culture, but also to accompany it with a good CRM technological solution and a good strategy for innovation and development.

From these conclusions, if considered by the managers of the companies represented by the analyzed sample, an increase in the adoption rate of CRM technologies should be derived, and consequently an improvement in the general management of customers that companies in the

sector make. Once again, and as a consequence of all this, the most relevant impact should be the improvement in the level of customer satisfaction, and greater market perfection.

6.2.- Practical and Social implications

The present study covers a research gap in that it empirically validates the relationship between the use of CRM and the improvement in organizational performance (and with it, predictably, also improvement in business results) in the wine production and distribution sector.

The winery sector has traditionally been reluctant to face digital transformation and the massive adoption of business management technologies. Only large groups of companies, through corporate policies, have faced this process in a generalized way. That is why, focusing this study on medium and small companies, it should be taken into account by this type of company that continue to doubt the potential for management improvement and results that the use of CRM can bring to their organizations. This should lead, once again, to a higher rate of adoption of CRM, and with it a general improvement in the management of customer relationships in this sector so representative of the Spanish economy. Greater adoption of CRM can bring better knowledge about the customer, better Customer-centered strategies, and better service to customers, with greater satisfaction and greater market efficiency.

6.3.- Limitations

The present study has some limitations, as a result of the need to select sufficiently representative elements of the research model and of the study population. Despite all of this, the simplifications assumed in the study were made based on the literature analyzed, and trying not to lose representativeness in the results and conclusions obtained.

To carry out the empirical validation process of this study, a range of wineries was chosen which, following billing parameters and organizational structure, are considered representative of the sector, according to the literature reviewed. Some companies may have been left out of the sample under study, but we consider that the sample is sufficiently representative of the population to assume that even these companies can be reflected in the results and conclusions obtained in the study.

On the other hand, the use of CRM that each company can make can be very different depending on the winery under study. That is why, to avoid treating all the wineries that use CRM in the same way, "CRM practices" was taken as an independent starting variable, which contains elements that in themselves and as a whole define the degree of use of CRM. More complex elements and ranges could have been defined within the CRM Practices variable, which would have predictably generated greater variability in results, but due to the characteristics of the companies in the sector, we do not expect that the conclusions would have been different in terms of their meaning and managerial input.

6.4.- Future research

As lines of future research, directly related to the study realized, carrying out the following studies is considered very interesting :

- Checking, by changing a variable in the model, how the results and conclusions of the study would change. Specifically, we consider it interesting to replace the variable "Innovation" with the variable "Management of customer knowledge".

- Create a variant of the research model, adding "Customer Knowledge Management" as an intermediate variable, which together with "Innovation" would lie (as anticipated by the expected benefits map) between the use of CRM and the improvement of the organizational performance.

Far from these lines of research, highly related to the variables and paths that were seen as possible during the study, and among which the path outlined in this thesis was chosen, there are other paths that are proposed for future research:

- Include in the model the impact that the use of "Cloud Computing" platforms, in its three models (SaaS, PaaS, IaaS) can have on the adoption and use of CRM, and finally on business performance. This type of solution is found to have reduced the entry barrier, by not needing an initial investment and by being able to pay for use without the need to create fixed assets, which has definitely contributed to the degree of adoption of the technology. It will be interesting to validate whether this has improved the ratio of improvement in results.
- Analyze, together with CRM, the influence and impact of other technical business management solutions such as Enterprise Resource Planning (ERPs), Business Analytics, etc.

The high development of the Information Technologies in recent decades, due to the reduction of entry barriers, and due to the increasing complexity of management in the business world that requires a high power of information processing by management tools , gives a very encouraging future for any study carried out in this area. There is increasing accessibility to information, and therefore also to scientific research, so the impact and value of any of the studies that conduct any of these lines of research can be decisive in the decision-making of companies of all types.

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Capítulo 7 : Conclusiones

1.- Conclusiones.

Tras el trabajo de investigación realizado, queda constatado que el creciente interés por las soluciones de gestión empresarial CRM queda justificado con los resultados y conclusiones obtenidos en cada etapa del proceso realizado.

Durante el proceso de realización del presente trabajo de investigación, se ha dado respuesta y se han cumplido los objetivos marcados al principio del mismo. Tal y como se pretendía, la presente tesis doctoral ha identificado y validado de forma empírica el vínculo entre el uso de CRM y la mejora en el desempeño organizacional de las empresas, a través de la interacción con las estrategias empresariales de innovación. Esta validación empírica se ha llevado a cabo en las empresas del sector de producción y distribución de vino en España.

De forma particular, se ha dado respuesta a todos y cada uno de los objetivos iniciales:

1. Se ha analizado cuál es la relevancia de CRM como herramienta tecnológica de gestión empresarial a través de un doble enfoque cualitativo y cuantitativo.
2. Se ha identificado los focos de investigación (autores, editoriales, entidades y países) más productivos e influyentes en el ámbito de CRM, habiendo sido los más estudiados y usados como base para las siguientes etapas del estudio.
3. Se ha analizado en profundidad las conclusiones obtenidas en los artículos más influyentes publicados en torno a la temática de CRM
4. Se han identificado cuáles pueden ser, a priori y de forma teórica, los beneficios esperados del uso de CRM en las PYMES.
5. Se ha conseguido demostrar que CRM se puede posicionar como herramienta de desarrollo sostenible, no solo en el momento presente sino también a futuro, con efecto prolongado en el tiempo.
6. Se han identificado las variables más relevantes y determinantes en la consecución de mejoras en el desempeño organizacional a partir del uso de CRM.
7. Se ha construido un modelo de investigación, con sus constructos y elementos claves, para validar el impacto del uso de CRM sobre la consecución de un buen desempeño organizacional.
8. Se ha validado empíricamente el modelo de investigación construido en el sector de las bodegas españolas, con la esperanza de que los resultados ayuden a las empresas del sector a tomar sus decisiones sobre la idoneidad de CRM como herramienta clave de gestión empresarial.
9. Se han identificado de forma empírica cuáles son las condiciones que están vinculadas de forma necesaria y/o suficiente con la consecución de un buen desempeño organizacional a través del uso de CRM y de la adopción de estrategias de innovación.

Ya con un primer análisis cuantitativo de las publicaciones previas, mediante un análisis bibliométrico, queda patente que la tendencia investigadora en el ámbito de CRM es creciente desde su aparición en los años 70s, y de forma mucho más acusada desde el año 2.000. Este estudio no pone de manifiesto que ninguna entidad, ni autor, ni siquiera un país, esté monopolizando de forma clara el interés por esta tecnología de gestión empresarial.

La revisión extensa de la literatura relacionada, muestra que efectivamente hay un claro vínculo entre CRM, innovación, y desempeño organizacional, al menos desde el punto de vista de las tendencias en el mundo de la investigación.

De todo lo revisado y analizado se concluye y acepta como general un mapa de beneficios esperados del uso de CRM que avanza en dos direcciones: la de la explotación de la potencia de la herramienta en el momento presente para una eficaz y eficiente gestión del conocimiento del cliente, y la de la prolongación del impacto de su uso en términos de sostenibilidad y efectos duraderos a futuro por causa de su estrecho vínculo con las estrategias de innovación. Todo ello, de forma estructurada y coherente, lleva a inferir un beneficio global del uso de CRM en términos de mejora en el desempeño organizacional, y con él una mejora de los resultados empresariales.

A falta de la existencia de un modelo de investigación general y completo que vincule estas tres grandes variables (uso de CRM, investigación, y desempeño organizacional), se ha construido un modelo que las relaciona a través de tres hipótesis de trabajo, para las que se ha orquestado un cuestionario para recogida de datos. Este modelo debería poder ser aplicado en cualquier sector o lista de empresas para las que se requiera validar si el impacto de uso de CRM efectivamente justifica el esfuerzo de su despliegue y uso.

En el caso de la presente investigación, habiendo seleccionado el sector de producción y distribución de vinos como uno de los más representativos de la economía española, se ha acudido a la metodología fsQCA para validar qué condiciones se postulan como suficientes y/o necesarias para que el uso de CRM y de planes de innovación traigan beneficios a las empresas en términos de desempeño organizacional. La conclusión final confirma las expectativas iniciales, por las que una buena cultura de énfasis en la gestión de las relaciones con los clientes ("*Customer relationship management"*) es clave en la obtención de un buen desempeño organizacional, y aún más si se acompaña del uso de una solución tecnológica CRM. También el acompañamiento de estrategias de innovación de procesos mejora las expectativas de mejoras en el desempeño y en resultados. Por otro lado, en ningún caso se garantiza que estos resultados se vayan a dar, si bien con un elevado índice de probabilidad (medido en términos de consistencia y cobertura) sí que se infiere una razonable expectativa de cumplimiento.

1.1.- Aportaciones de interés empresarial.

El enfoque de este estudio es eminentemente práctico, con lo que el objetivo pretende tener un claro carácter aplicado de interés empresarial. Partiendo de un análisis teórico del marco conceptual, el presente trabajo de investigación está enfocado desde sus primeros pasos a crear un modelo de investigación que sirva como base para comprobar empíricamente la relación de impacto entre el uso de CRM y la pretendida mejora en el desempeño organizacional.

En este caso, tras haber creado un modelo de investigación aplicable de forma general a cualquier grupo de empresas o sector productivo, en base al mapa de beneficios esperados del despliegue y uso de soluciones tecnológicas CRM, se ha validado la relación causal de impacto entre las variables CRM (con sus elementos tecnológico y cultural) y las estrategias de innovación (tanto de procesos como de productos), ambas dos en relación directa con la variable Desempeño Organizacional. Para ello se ha elegido el sector de producción y distribución de vinos en España, las bodegas básicamente. Este sector se ha elegido por varios motivos, entre

los cuales su tejido productivo compuesto mayormente por PYMES (en gran parte empresas familiares), lo cual es claramente compartido por muchos sectores productivos españoles; se ha elegido también por el alto componente de calidad y reconocimiento nacional e internacional del producto que ofrecen; y finalmente se ha elegido este sector porque, de la experiencia previa del autor, tras muchos años trabajando en un proveedor internacional con una posición de mercado dominante en este tipo de tecnologías, se conoce de la tradicional reticencia de las empresas de este sector por adoptar este tipo de tecnología.

La aportación pretendida con mayor afán por parte del autor ha sido evaluar de forma empírica y no influenciada por ningún interés particular de ningún actor de mercado (véase fabricante de soluciones CRM, o distribuidor de las mismas, o empresa de consultoría), la relación causal directa entre el uso de estas soluciones y las mejoras en el desempeño de la empresa. El objetivo final ha sido y es que, las empresas del sector que tengan dudas sobre la conveniencia de desplegar una solución CRM, puedan usar las conclusiones de este estudio como base para tomar su decisión.

El valor que este estudio tiene para el sector empresarial se puede identificar en dos ámbitos bien diferenciados, por un lado, desde el punto de vista de las empresas del sector en estudio (el de la producción y distribución de vinos en España), y por otro lado desde el punto de vista de las empresas fabricantes y/o distribuidoras de soluciones tecnológicas de gestión TIC.

En cuanto a las empresas del sector, las bodegas, este estudio pretende ser un punto de partida para todas aquellas que tomen en consideración la adopción de un sistema CRM como alternativa de digitalización. Habiendo elegido una muestra de empresas representativa del sector, y habiendo demostrado cuales son las condiciones que acompañan a CRM de mejoras en el desempeño organizacional, se espera que toda empresa del sector que dude en si afrontar o no un proyecto de despliegue de CRM pueda valorar los resultados de este estudio y actuar en consecuencia.

Desde el segundo punto de vista, el de los fabricantes de soluciones CRM, y también de las empresas de consultoría e implementación de soluciones TIC (y CRM en particular), este estudio pretende demostrar cómo en un sector tradicionalmente poco abierto a la adopción de estas tecnologías, se puede demostrar de forma científica cuales son los condicionantes que pueden hacer que estas soluciones de gestión mejoren en su valoración y en su nivel de aceptación por parte de las empresas objetivo.

La aportación más importante es pues, en un sector tradicionalmente poco favorable al uso de este tipo de soluciones tecnológicas, abrir el camino hacia un cambio cultural que permita usar la potencia de estas tecnologías de forma eficiente y con una expectativa más bien cierta de poder obtener mejoras en el desempeño organizacional y en los resultados empresariales.

1.2.- Aportaciones de interés académico-científico.

Dado el relativamente escaso tratamiento de investigación científica al respecto de las soluciones CRM, con un claro despegue a partir del año 2000, como se ha constatado en la elaboración del marco conceptual, se deduce que esta temática de estudio está aún en su juventud, en la etapa de crecimiento, y que por tanto goza de grandes expectativas de futuro.

También se ha descubierto que el impacto de uso de CRM se puede estudiar en dos ámbitos, el presente y el futuro. El impacto presente se desarrolla a través de la explotación de la potencia de la herramienta en la gestión del conocimiento que la empresa tiene sobre sus clientes. El impacto a futuro se relaciona con las ventajas que puede traer a la gestión empresarial a través de la interrelación de los sistemas CRM con las estrategias de innovación. A su vez, este planteamiento se relaciona directamente con una tendencia de análisis científico conocida como *Ambidexterity*, que plantea los campos de estudio en dos vertientes coexistentes y confluyentes en el objetivo final.

En la elaboración del mapa de beneficios esperados, se ha obtenido una visión muy acorde con una tendencia pretendida por muchas temáticas de estudio en la actualidad: la sostenibilidad. En un mundo empresarial dinámico y cambiante, reflejo del entorno social y cultural moderno, conseguir que los beneficios de cualquier acción sean sostenibles y duraderos en el tiempo le da un carácter de impacto que eleva dicha acción a la consideración de clave y crítica para la supervivencia de la empresa.

Haber creado un modelo de investigación general, aporta también al campo académico-científico la posibilidad de desarrollar este modelo en la dirección deseada por cada investigador en su campo de trabajo. En nuestro caso se ha tomado como base para aplicar un modelo de validación empírica a un sector concreto, pero esto se podría hacer para cualquier otro.

2.- Líneas futuras de investigación.

De la generalidad del modelo de investigación propuesto, se deriva la posibilidad de aplicar esta línea de trabajo en diferentes sectores o grupos de empresa. Consideramos como muy interesante, por ejemplo:

- Replicar el mismo estudio en las empresas de otro sector cuyas características sean similares a las del sector analizado, para poder comparar los resultados y conclusiones
- Realizar la validación empírica del modelo en algún sector altamente digitalizado, con el fin de llegar a conclusiones de valía sobre cómo influye el grado de transformación digital en la adopción de sistemas CRM
- Comprobar, mediante el cambio de una variable del modelo, cómo cambiarían los resultados y conclusiones del estudio. En concreto se propone como interesante sustituir la variable "Innovación" por la variable "Gestión del Conocimiento sobre el cliente".
- Crear una variante del modelo de investigación, añadiendo como variable intermedia la "Gestión del Conocimiento sobre el cliente", que junto con la "Innovación", intermediarían (como anticipaba el mapa de beneficios esperados) entre el uso de CRM y la mejora del desempeño organizacional.

Lejos de estas líneas de investigación, altamente relacionadas con las variables y caminos que han ido vislumbrándose como posibles durante la realización del estudio, y de entre las que se ha elegido el camino planteado en esta tesis, existen otros caminos que se proponen para futuras investigaciones:

- Incluir en el modelo el impacto que el uso de plataformas *"Cloud Computing"* (computación en la Nube), en sus tres modelos (SaaS, PaaS, IaaS) puede tener en la

adopción y uso de CRM, y finalmente en el desempeño empresarial. Este tipo de solución se constata que ha reducido la barrera de entrada, por no necesitar de inversión inicial y por poder pagar por uso sin necesidad de crear inmovilizado, con lo que ha contribuido definitivamente al grado de adopción de la tecnología. Interesante será validar si esto ha mejorado la relación de mejora en resultados

- Analizar juntamente con CRM, la influencia e impacto de otros sistemas TIC como los Enterprise Resource Planning (ERPs), Business Analytics, etc.

El alto desarrollo de las TIC en las últimas décadas, por la reducción de las barreras de entrada, y por la cada vez mayor complejidad de gestión en el mundo empresarial que requiere de una elevada potencia de procesamiento de información por parte de las herramientas de gestión, da un futuro muy alentador para todo estudio que se haga en esta área. Cada vez hay mayor accesibilidad a la información, y por tanto también a las investigaciones científicas, por lo que el impacto y valía de cualquiera de los estudios que conduzcan alguna de estas líneas de investigación puede ser determinante en la toma de decisiones de empresas de todo tipo.

Capítulo 8 : Bibliografía

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